2016

HAZARD ANALISIS OF CRITICAL CONTROL POINT

(Issue- 05, revision-01, March 2016)

RACSL MANUAL- III

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The RACSL – Cuttack Unit manual was organized into and broadly covers procedures:

Part – I:
QMS & FSMS

PART – II:
GMP, GHP, SSOP etc.

Part – III:
Product profile and HACCP Management

Part – IV:
SOP, PRP/OPRP

Part – V:
ISO17025 for Internal Lab

Authorized by: Aditya Dash

(Managing Director)

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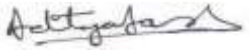

(Managing Director)

1. Declaration

I am pleased to declare that this HACCP manual is authentic, original and the procedure and activities enumerated in this manual are true & correct.

This manual complies with USFDA HACCP/ cGMP regulation (21 CFR, part110) and/ or codex alimentary guidelines on GMP (EC directives ;91/493/EEC and 94/356/EC). The manual further covers procedure of SOP, SSOP & quality control program etc.

This manual also cover requirement of EIC (Export Inspection Council) Govt. of India.

This is the fifth reviewed manual and procedure outline in this manual are mandatory and shall be followed by all the employees of M/s RAM'S ASSORTED COLD STORAGE LTD.

This shall be vogue of for a period of 12 months from 01.03.2016 to 28.02.2017

Issued by

Mr. Aditya Dash
Managing Director

Date 01.03.2016

Area affected by recent revision are identified suitably.

Warning: No part of this document may be reproduced in any form without the written authorization of Ram's Assorted Cold Storage Ltd. Arakhakuda, Telengapenta Cuttack. All inquiries regarding this manual shall be directed to the"Management representative"for its administration.

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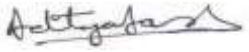

(Managing Director)

2. Quality Policy

Ram's Assorted Cold Storage Ltd. are committed to guarantee customer's satisfaction for every single use of product by providing quality, legal and safe wholesome seafood by timely processing and in time delivery which is achieved through effective team work and continual improvement.

ADITYA DASH

MANAGING D I R E C T O R
RAM'S ASSORTED COLD STORAGE LIMITED

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(Managing Director)

3. Quality Objectives

THE QUALITY OBJECTIVE OF THE VARIOUS PRODUCTS ARE AS FOLLOWS.

PRODUCT	YIELD %
HLSO BLACK TIGER	65% - 67%
HLSO EZ PL BLACK TIGER	60% - 63%
PDTON BLACK TIGER	58% - 60%
PDTOFF BLACK TIGER	55% - 57%
PUD BLACK TIGER	48% - 50%
HLSO VANNAMEI	71% - 75%
HLSO EZ PL VANNAMEI	70% - 73%
PDTON VANNAMEI	66% - 68%
PDTOFF VANNAMEI	60% - 62%
PUD VANNAMEI	58% - 60%
PD SEA CAUGHT MATERIAL	46% - 50%

- *To Achieve Finished Product TPC Level Below 5,00,000 cfu/gm from 20% to 18%.*
- *To maintain a temperature of < 4^0C right from procurement to freezing.*
- *The above quality objectives are monitored and maintained quarterly by General Manager.*

*** The Yield in percentage may be varying with various products, grade, and size and packing style.

Signature of Management Representative

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(Managing Director)

4. Food Safety Objectives

The food safety objectives are as follows,

- To control the total bacteria, count in the finish product to less than $2x10^5$ cfu /gm.
- To achieve the total hours of food safety training to minimum 12 hours per year per employee.
- Not more than 4 delayed orders for food safety reasons in the year.
- To reduce the incidence of customer complaints to 10% by the end of the year.
- To ensure 100% investigation of customer complaints & written response within 7days.
- Not more than 1% of packed products are returned because of failing packaging per month.

❖ ***The above food safety objectives are monitored and maintained quarterly by Director.***

Signature of Management Representative

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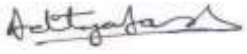

(Managing Director)

5. Company Profile

RAM'S ASSORTED COLD STORAGE LIMITED was set up in the year 1986-87. It was promoted by Mr. Eric Ram and Mrs. Sovita Ram. The company initially concentrated on setting up Cold Storages as an independent business activity. In 1996 the company put up a seafood processing plant at Telengapenta, near Cuttack. This plant is spread over an area of 3.5 acres and is today equipped with modern machineries like IQF, Flake Ice Machines, etc.

The company's products are exported all across the globe including Japan and European Union. The factory facilities are also having EU Registration enabling the company access to the lucrative European market.

The company is young and is led by a team of dynamic professionals with more than 30 years of international seafood experience between them. Consequently, strict quality control and supply chain management is leading to production of superior product quality which is gaining international recognition for the company. With a freezing capacity of 19 MT per day as approved by MPEDA and production capacity of 12 MT/day as approved by EIA, the company is poised to accelerate rapidly in the seafood industry.

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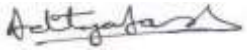
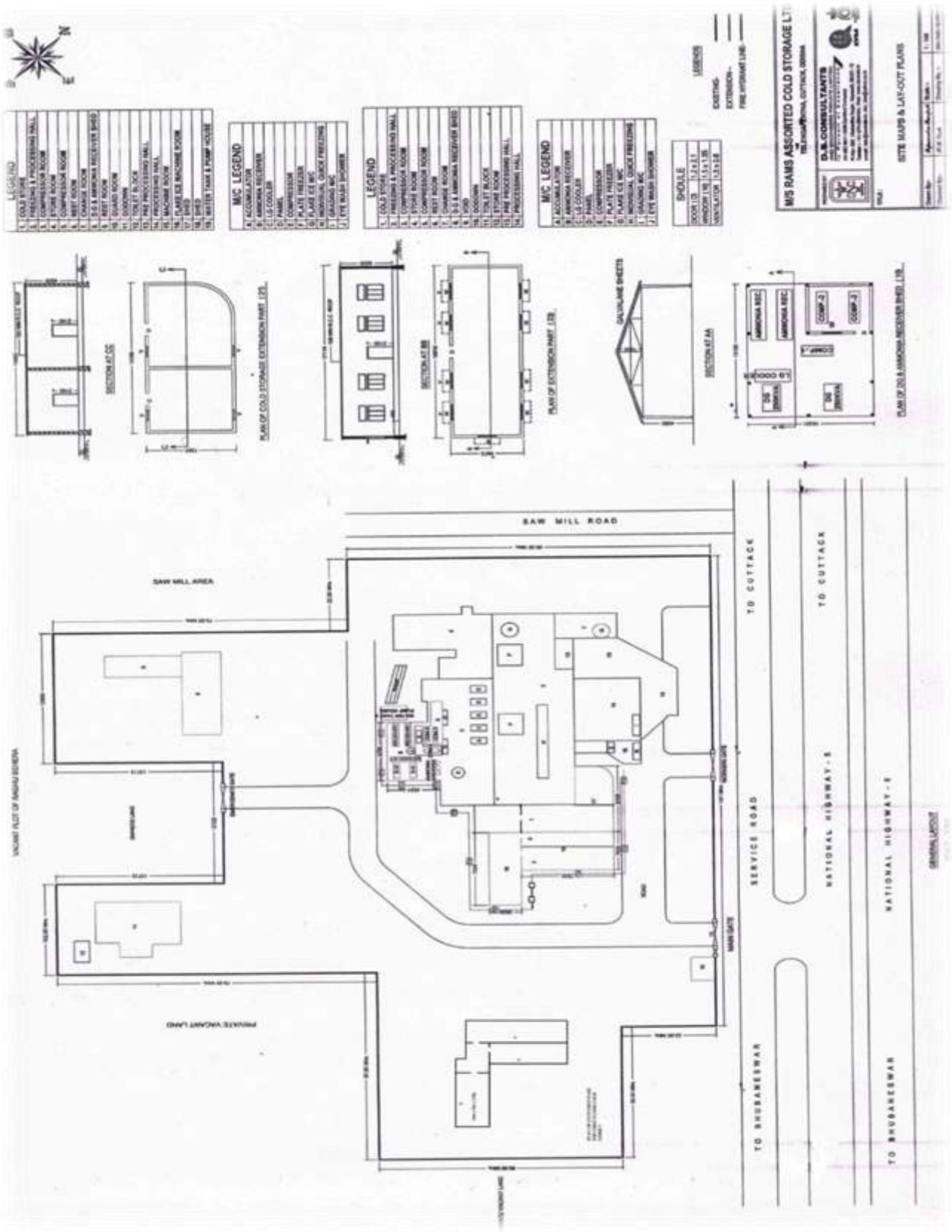


(Managing Director)

6. LAYOUT OF THE PROCESSING PLANT



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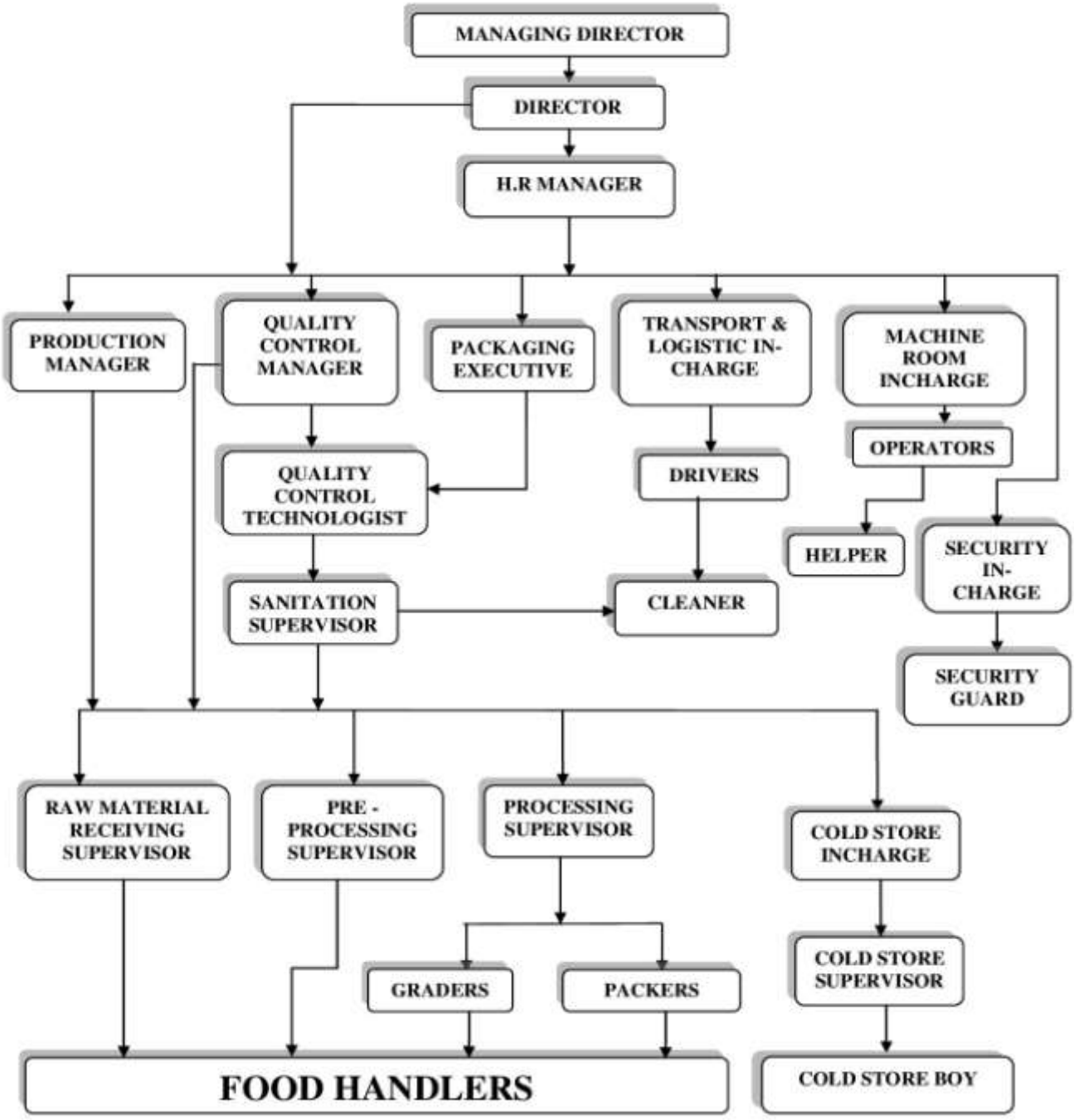
(Managing Director)

7. ORGANISATION CHART



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(Managing Director)

8. HACCP

I. Introduction

What is HACCP?

HACCP is an acronym that stands for Hazard Analysis and Critical Control Point. HACCP is a preventive system of hazard control. Food processors use it to ensure safer food for consumers. The HACCP system is designed to identify hazards, establish critical control points and control measures and to monitor these controls. Hazards can be harmful biological, chemical and physical contaminants.

II. HACCP Prerequisite Programs

In order for HACCP to be successful, it must be built upon a firm foundation of (i) compliance with current Good Manufacturing Practices (GMPs) and acceptable Sanitation Standard Operating Procedures (SSOPs), (ii) Trained company personnel, and (iii) Management commitment at the highest level.

III. Seven Principles of HACCP

There are seven basic principles of HACCP as under

Principle 1 Hazards Analysis

Conduct a hazard analysis. Prepare a list of steps in the process where significant hazards could occur and describe the preventive measures.

Hazard : A biological, Chemical or Physical property that may cause a food to be unsafe for consumption.

Principle 2 Critical Control Point Identification

Identify the critical control points in the process

Critical Control Point: A point, step or procedure at which control can be applied and a food-safety hazard can be prevented eliminated or reduced to acceptable levels.

Principle 3 Establish Critical Limits

Establish Critical Limits for preventive measures associated with each identified critical control point.

Critical Limit: It means a creation that must be met for each preventive measures associated with a critical control point.

Principle 4 Establish Monitoring Requirements

Establish Critical Control Point monitoring requirements. Establish procedures for using the results of monitoring to adjust the process and maintain control.

Monitor: To conduct a planned sequence of observations or measurements to assess whether a critical control point is under control and to produce an accurate record for future use in verification.

Principle 5 Establish Corrective Actions

Establish corrective actions to be taken when monitoring indicates that there is a deviation from an established critical limit.

Corrective Action: Procedures followed when a deviation from a critical limit occurs at a critical control point.

Principle 6 Establish Verification Procedures

Establish procedures for verification that the HACCP system is working correctly.

Verification: The use of methods, procedures or tests, in addition to those used in monitoring, that determine if the HACCP system is in compliance with the HACCP plan and/or whether the plan needs modification and revalidation.

Principle 7 Establish Record-Keeping Procedures

Establish effective record-keeping procedures that document the HACCP system.

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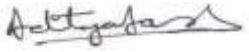

(Managing Director)

During the hazard analysis and subsequent HACCP plan design and application, consideration must be given to a number of factors. These include; the impact of raw materials, ingredients, and good manufacturing practices, the role of manufacturing processes to control hazards; the likely end-use of the product; consumer populations at risk; and epidemiological data relative to food safety.

The intent of the HACCP system is to focus control at the critical control points for minimizing the greatest risks to product safety. Redesign of the operation should be considered if a significant hazard is identified but no critical control points are found.
Flexibility within the context of the operation should be maintained in the application of HACCP to each specific operation. The HACCP plan should be reviewed and necessary changes made to it when a modification is made to the product or a manufacturing step, which changes the significance of a hazard(s), or alters the control or monitoring activities of a Critical Control Point.

IV. Hazards

A hazard is a biological, chemical or physical property that may cause a food to be unsafe for consumption.
To perform a hazard analysis for the development of a HACCP plan, knowledge of potential hazard is very essential. The HACCP plan is designed to control all "significant" food-safety hazards. Food safety hazards are categorized into three classes they are Biological, Chemical and Physical.

It is important to understand that, for the purpose of HACCP, hazards only refer to the conditions or contaminants in food that can cause illness or injury to people. Many conditions are highly undesirable in food, such as the presence of insects, hair, filth or spoilage. Economic fraud and violations of regulatory food standards are equally undesirable. All of these defects must be controlled in food processing.

A. Chemical Hazards

Chemical contamination can happen at any stage in food production and processing, including harvesting and growing (aquaculture). Chemicals are not hazardous if properly used or controlled. Potential risk to consumers increase when chemicals are not controlled or the recommended treatment rates are exceeded. The presence of a chemical may not always represent a hazard. The amount of the chemical may determine whether it is a hazard or not. Some may require exposure over prolonged periods to have a toxic effect. Regulatory limits are set for some of those contaminants.

B. Biological Hazards

Food born biological hazards include bacterial virus and parasitic organisms. Bacterial Pathogens comprise the majority of food born diseases. Many of these pathogens occur naturally in the environment. Most are killed or inactivated by adequate cooling or cooking. A certain level of pathogens can be expected with some raw foods. Temperature abuse i.e holding high temperature can significantly multiply number or activates pathogens. Parasites are most often host specific fish born parasites in products that are intended to be eaten raw or to be cooked can be killed by effective freezing techniques.

C. Physical Hazards

Physical hazards include any potentially harmful extraneous matter not normally found in food. Metal-to-metal contact, especially in mechanical cutting and blending operations and with equipment that has part that can break or fall off, such as wire-mesh belts, can introduce metal fragments into products. Such fragments serve as a hazard to the consumer. This hazard can be controlled by subjecting the product to metal detection devices or by regular inspection of at-risk equipment for signs of damage.

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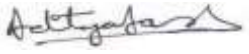

(Managing Director)

D. Economical Hazards

Another significant hazard can be effect the commercialbility of the product due to mistake of product description i.e. non-conformity of product declaration vis-a-vis, weight count, etc. This hazard can be the result of the workmanship during course of production and can be controlled by proper supervision.

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(Managing Director)

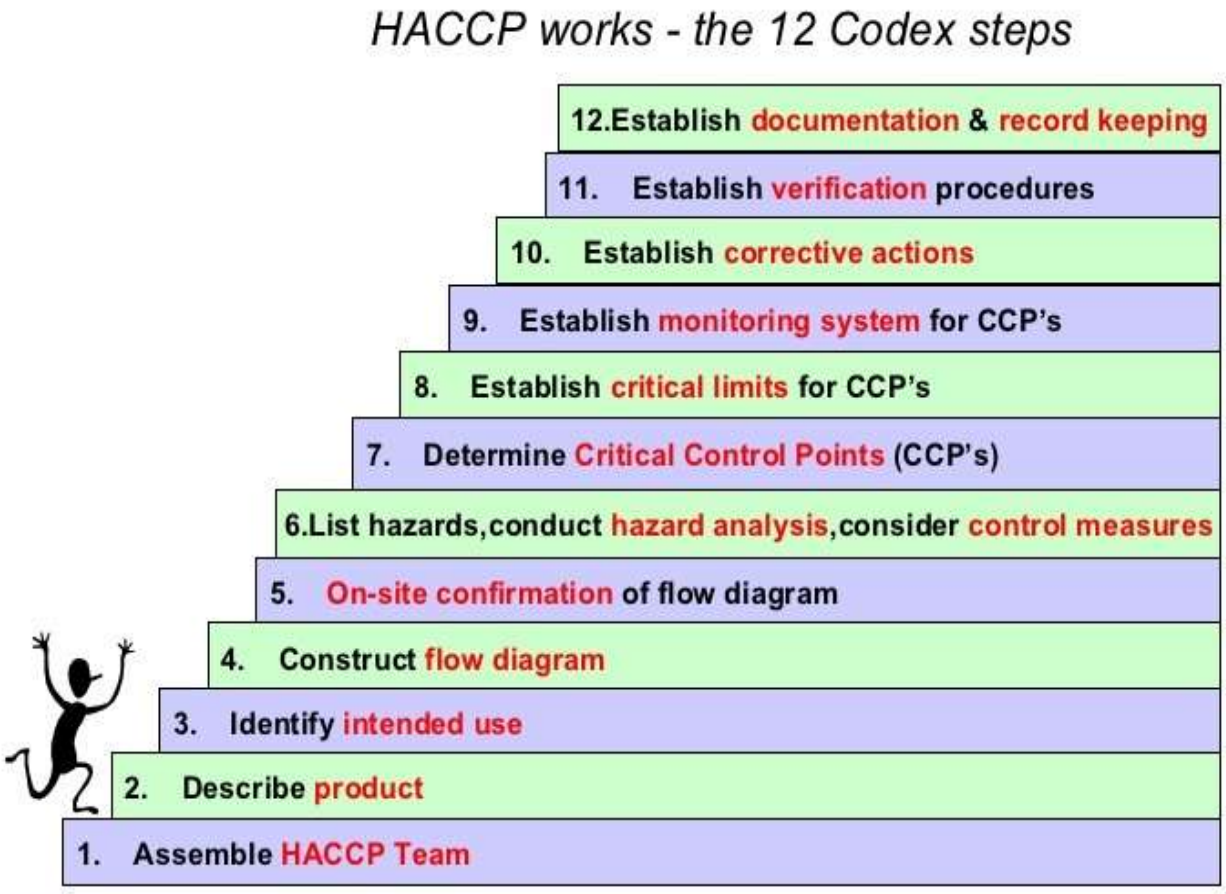
9. HACCP SCOPE:

We Ram's Assorted Cold Storage Ltd, with a view of improving its overall efficiency and effectiveness has focused on the custom and process approach and has adopted Hazard Analysis Critical Control Point system.

Purpose:

This manual covers in details from raw material receiving to still shipment. The Hazard Analysis and Hazard Plan for all products processed within the company with a view to ensure food safety of the product especially the following are covered as per Codex Alimentary.

12 Step's of HACCP:



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10. HACCP Team Responsibility

I. HACCP / FOOD SAFETY

The HACCP team has been formed and approved by the Managing director of the company, keeping in mind the management's commitment to implements the quality system in totally. The HACCP team leader is appointed by managing Director.

Managing Director is the chief authority for the welfare official staff & workers as well as administrative, financial sanction for implementing the quality system of our company.

The Quality Control In-charge is the HACCP team leader. In the absence of team leader, the quality control Technologist will have the team leader responsibilities and the same shall be communicated to the HACCP team time to time. Others member in the team are the departments head of following areas

II. HACCP Team Competency and Training

Team leader provides training to the new members in HACCP team on HACCP & site procedures on requirement basis based on the review of monthly team meetings. Team leader shall provide training to the members and other staff to increase the competency.

III. HACCP / Food Safety Team

As it is a collective effort or teamwork to produce a good product, the following are the responsibilities so the team members to do so.

Sl. No.	Name	Designation	Role in the Team	Qualification	Experience
1	SABIR SAHAJADA	Q.C/Q. A IN-CHARGE	Team Leader/qualified HACCP Trainer	B.Sc.	4 Years
2	KHALID MANSOOR , SUBHRA DASH, LIPIKA DAS	Q.C/QA TECHCNOLOGIST, Q.C/QA TRAINEE TECHCNOLOGIST	Member/qualified HACCP Trainer Member	B.SC M .Sc	4 Years 5 month
3	ARUN DASH	DIRECTOR	Member	B.COM	30Years
4	ADITYA DASH	MANAGING DIRECTOR	Member	BBA	8Years
5	SEBASTIAN V.M	PRODUCTION MANAGER	Member	BA	22Years
6	JYOTI RANJAN ACHARYA	MACHINE ROOM IN-CHARGE	Member	B.TECH	2Years
7	RANJIT LENKA	MARKETING	Member	B.COM	6 Years
8.	SANTOSH SWAIN	GENERAL STORE	Member	B.SC	2Years
9	PITAMBAR BEHERA	HR MANAGER	Member	BA ,LLB, MBA HR	3Years
10.	GIRISH JENA	COLD STORAGE IN-CHARGE	Member	BA	10 Years
11	S.DALAEI	H&S SUPERVISOR	Member	IA	6 month
12	ASHOK PRADHAN	SECURITY IN-CHARGE	Member	IA	8 YEARS

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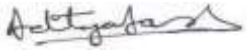

(Managing Director)

IV. HACCP Team Roles and Responsibilities

Sl. No	Designation	HACCP Designation	HACCP RESPONSIBILTIES
1	Managing Director	Member	Periodic review of HACCP, Periodic Q.C review. Customer interaction/recall recruitment. Periodic audit & review of GMP, SSOP & SOP liaisons with Govt. Authorities for inspection, approval etc. **In his absence Director will responsible.**
2	Director	Member	Periodic review of HACCP, Periodic Q.C review. Customer interaction/recall recruitment. Periodic audit & review of GMP, SSOP & SOP liaisons with Govt. Authorities for inspection, approval etc. **In his absence Managing Director will responsible.**
3	Production Manager	Member	Implementation of GMP, SSOP, and SOPS Audit review GMP, SSOP & personnel hygiene maintenance. Skill training to achieve objectives production speed. Implementation of SOP for raw material receiving /preprocessing activities & co-coordinating with purchasing center. **In his absence Quality control in-charge will be responsible.**
4	Quality control In-charge	Member	HACCP documentation & updating monthly audit. Reviews & training monitoring of HACCP, SSOP, SOP, QMS activities. Supervises the online inspection & in house testing of the product. Plant approval status with EIA/MPEDA etc. Carried out the internal audit. Buyer specification for products. **In his absence Q.C technologist will be responsible.**
5	Q.C Technologists	Member	HACCP documentation & updating monthly audit. Reviews & training monitoring of HACCP, SSOP, SOP, QMS activities. Supervises the online inspection of the product. Plant approval status with EIA/MPEDA etc. Carried out the internal audit. Buyer specification for products. **In his absence Q.C In-charge will be responsible.**
6	Machine room in charge	Member	GMP plant machineries, maintenance of ice, water, gas & power plumbing insulation and refrigeration. Preventive maintenance of all the equipment. **In his absence operator will be responsible.**
7	Cold store In-charge	Member	Implementation of SOP for cold stores. Monitoring & verification of loading / unloading. Verification of cold stores temperature. Up to date of FIFO/FEFO system in cold stores. Maintenance of non-conformity, sample bank, shelf life study. Follow up of up to date packing specification. Up to date CCP of metal detection status**. In his absence cold store supervisor will be responsible.**
8	HR Manager	Member	Recruit & training of employee. Liasoning with govt. Office. Involved in factory administration. **In his absence Production manager will responsible.**
9	General store Manager	Member	Responsible for purchasing of departmental requirement item or goods as well as stock enter of all incoming materials Responsible for quality of products been purchase. Responsible for outgoing and incoming of vehicle for raw materials. Co- ordinate with Director, Production Manager, Q.C manager. **In his absence assistant general store in-charge will be responsible**

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(Managing Director)

10	H&S SUPERVISOR	Member	Reports to Q.C. Manager & Q.C. Technologists in day to day operations. Reviews the day to day hygiene & sanitation of the plant. Trained the workers for personal hygiene & cleanliness **In his absence Q.C technologist will be responsible.**
11	SECURITY INCHARGE	-	When the product comes to the factory to security department is also responsible for all type of documents verification and record keeping When the visitors come to factory, the visitors log book shall be maintained by the security department. When the finished products are completed as per the buyer's P.O, it should be loaded in refrigerated container; the security officer should be present at that time. **In his absence security guard will be responsible**

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(Managing Director)

11. Hazard Analysis

I. Introduction

The HACCP Team conducted brain strong session to identify all the hazards likely to happen in each processing step. Finally, they enlisted potential hazards by considering the hazards from the angles.

a. What is the likelihood of it happening?
b. How severe are the consequence?
c. If it happens, how many people affected

Scoring has given as Low=1, Medium=2 & High=3

Based on the score of each category will be multiplied to arrive a total score of each step and categorizing each step based upon the score into potential hazards or not.

(I) Potential hazards when score 18 or above.

(II) Non potential hazards when score below 18

II. Hazard Analysis for Processing steps

Process step	Hazards	Likelihood	Severity	People affected
Raw material receiving step	If the material is temperature <4^{0}C, there is possibility of microbial growth. Supplied raw material may contain sulphite and prohibited antibiotics /pesticides.	3	3	3
Weighing /washing	If water is not properly disinfected, there is chance of microbial contamination.	1	1	3
Grading/ freezing	If water do not adhere GMP, (SOP) there is chance of cross contamination.	1	1	2
Metal detection	Inclusion of any metal in any form may cause injury to the consumer.	3	3	3
Labeling	Shrimps is an allergen	3	3	3

A. Scoring

Raw material receiving step : 27
Weighing /washing : 3
Grading /freezing : 2
Metal detection : 27
Labeling : 27

By risk assessment, it is concluded that the following hazards are enlisted as potential hazards

(I) Raw material receiving step.
(II) Metal detection
(III) Labeling

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(Managing Director)

III. Hazard Analysis work sheet for water & Ice

Firm Name: Ram's Assorted Cold Storage Ltd. **Address :** Arakhakuda, Telengapenta, Cuttack	**Types of additives:** USFDA or EU approved additives and Salt. Storage : Chemical Room. **Distribution :** used as per buyer requirement

Sl no	**Entity**	**Identify potential hazards introduced controlled or enhanced at this step**	**Whether it is significant or not**	**Justification for decision in column no .3**	**What preventive measure(s) can be applied to prevent the significant hazard?**	**Is this step critical control point?**
	Water & ice	**Biological** Presence of pathogens	No	Ground water is drawn from bore well & collected at the first filtration plant through spring basis. The water is passed through water treatment plant with softener/chlorine dosing, ozone dozer & water passing through UV light. Overhead tanks are cleaned as per schedule. Sanitary surveillance of water & ice is carried out once in 6month & once in a 2 year, water & ice sent to outside approved lab for testing of EC rule of 98/83/EC. Treated water as above is used for ice manufacturing & flake ice machine are well maintain (SSOP).		No
		Chemical	No	Water is tested for all chemical parameter once in 6 month & once in a 2 year as per 98/83/EC at approved lab.		No
		Physical Extraneous matter	No	Controlled through water treatment plant & the flake ice machine is well maintained(SSOP)		No

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(Managing Director)

IV. Hazard Analysis Work Sheet Additives

Firm Name: Ram's Assorted Cold Storage Ltd. **Address :** Arakhakuda, Telengapenta, Cuttack				**Types of additives:** USFDA or EU approved additives and salt. Storage : Chemical Room. **Distribution :** used as per buyer requirement		
Sl no	**Entity**	**Identify potential hazards introduced controlled or enhanced at this step**	**Whether it is significant or not**	**Justification for decision in column no .3**	**What preventive measure(s) can be applied to prevent the significant hazard?**	**Is this step critical control point?**
	Additives & salt	**Biological** Presence of pathogens	No	Only USFDA or EU approved additives (CARNAL, non-phosphate, & iodized salt) are used. Supplier test certificate is checked. Salt is test for staphylococcus & sulfite reducing clostridium once in six months at approved lab. If the same batch of salt is being used for more than six months, sample shall be collected after purchase of the next batch. Sample from different container shall be drawn so that a composite sample is collected for this purpose.	……	No
		Chemical Nil	No	Only USFDA or EU approved additives (CARNAL, non-phosphate & iodized salt) are used. Supplier test certificate is checked. Additives are monitored once in six months by drawing sample, especially from finished product of shrimps for testing sulfite & added phosphate. The representative sample is drawn from a selected code at random. From the carton are selected, composite sample is drawn from testing the additives	……	No
		Physical Extraneous matter	No	Only USFDA or EU approved additives (CARNAL, non-phosphate & iodized salt) are used. Supplier test certificate is checked. Only sealed bag is accepted, any damage & seal broken material is send back to supplier. Stored in our chemical room, maintain through SSOP.	…….	No

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(Managing Director)

V. Hazard Analysis Work Sheet for Packing Material

Firm Name: Ram's Assorted Cold Storage Ltd. **Firm Address:** Arakhakuda, Telengapenta, Cuttack				**Types of additives:** Food grade corrugated fiber master cartons board, inner cartons/paper duplex, inner master carton, poly bags etc. **Storage** : Packing material room **Distribution** : used as per buyer requirement		
Sl no	Entity	Identify potential hazards introduced controlled or enhanced at this step	Whether it is significant or not	Justification for decision in column no .3	What preventive measure(s) can be applied to prevent the significant hazard?	Is this step critical control point?
	Packing material	**Biological** Presence of pathogens	No	Food grade packing material is used. There is no history of presence of any biological hazards in packaging materials. Packaging materials are stored in our packing material store. (Maintain through SOP.)	……	No
		Chemical Nil	No	Food grade packaging material is used. There is no history of presence of any chemical hazards in packaging material. Food grade printing /marking ink & HDP/LDP are used.	……	No
		Physical Extraneous matter	No	Packaging material are stored in packing material room, properly covered with polythene sheet. Storing & racking is done brand wise/ product wise /lot wise. So that mixing of brand /variety & lot shall be avoided. (maintain through SSOP & SOP)	……	No

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(Managing Director)

12. RACSL Product Profile

The manual covers details of the following products those are being processed in this facility have been covered under this manual;

Line	Type of Freezing	Species
1.	Individual Quick Freezing Raw	*Penaeus monodon* *Penaeus indicus* *Penaeus semisulcatus* *Parapenaeupsis stylifera* *Litopenaeus vannamei* *Metapenaeus affinis* *Metapenaeus monoceros* *Metapenaeus dobsoni*
2.	Block Freezing Raw	*Penaeus monodon* *Penaeus indicus* *Penaeus semisulcatus* *Parapenaeupsis stylifera* *Litopenaeus vannamei* *Metapenaeus affinis* *Metapenaeus monoceros* *Metapenaeus dobsoni*

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13. Fresh Frozen Raw Aquaculture Shrimps (Block Freezing)

I. Product Description of Raw Block Frozen Aquaculture

Source of Raw Material	Fresh raw material purchased from registered farms after pre-harvest testing of antibiotic report. (Aquaculture material)
Product	Fresh block frozen raw shrimps
Varieties	Head on – shrimps (H/on)
	Headless Shell-on Shrimps (HL, EZ PEEL)
	Peeled Deveined Tail-on (PDTO, Round cut)
	Peeled Deveined Tail-on (BUTTERFLY 70% Cut)
	Peeled Undeveined Tail-off (PUD, Round cut)
Packing	6 x 1.816Kg, 10x2Kg, 6x1.2Kg,6x1Kg, 10x4lbs etc., (Type of pack and Pouch / M/c as per buyer's requirements)
Storage conditions	-18 Degree centigrade
Shelf life of the product	24 months from the production date or as per the specification of importing countries.
Method of Preservation	Contact Plate Freezer (Block freezing).
Additives used	Salt and Sodium-Tri-Poly-Phosphate (STTP) as per buyer's requirement or EU approved additives.
Distribution	To all countries by refrigerated carriers (including E.U Countries, Russian Federation & Australia), If we exported un cooked prawns to Australia, each batch tested on arrival in Australia and found to be free of WSSV and YHV. When we export the products for Russian Federation the sample is free from manmade radionuclide contamination. Sample is fit for human consumption from radiological point of view.
Intended use by customer	To be consumed by general public.**(Crustaceans) contain Allergens** When thawing, we recommend ….. Place Bag of shrimps overnight into the refrigerator or empty desire amount into a container of cool water for approximately 5 minutes drain. It's now ready for cooking. Re-freezing thawed product is not recommended.

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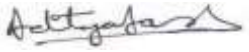

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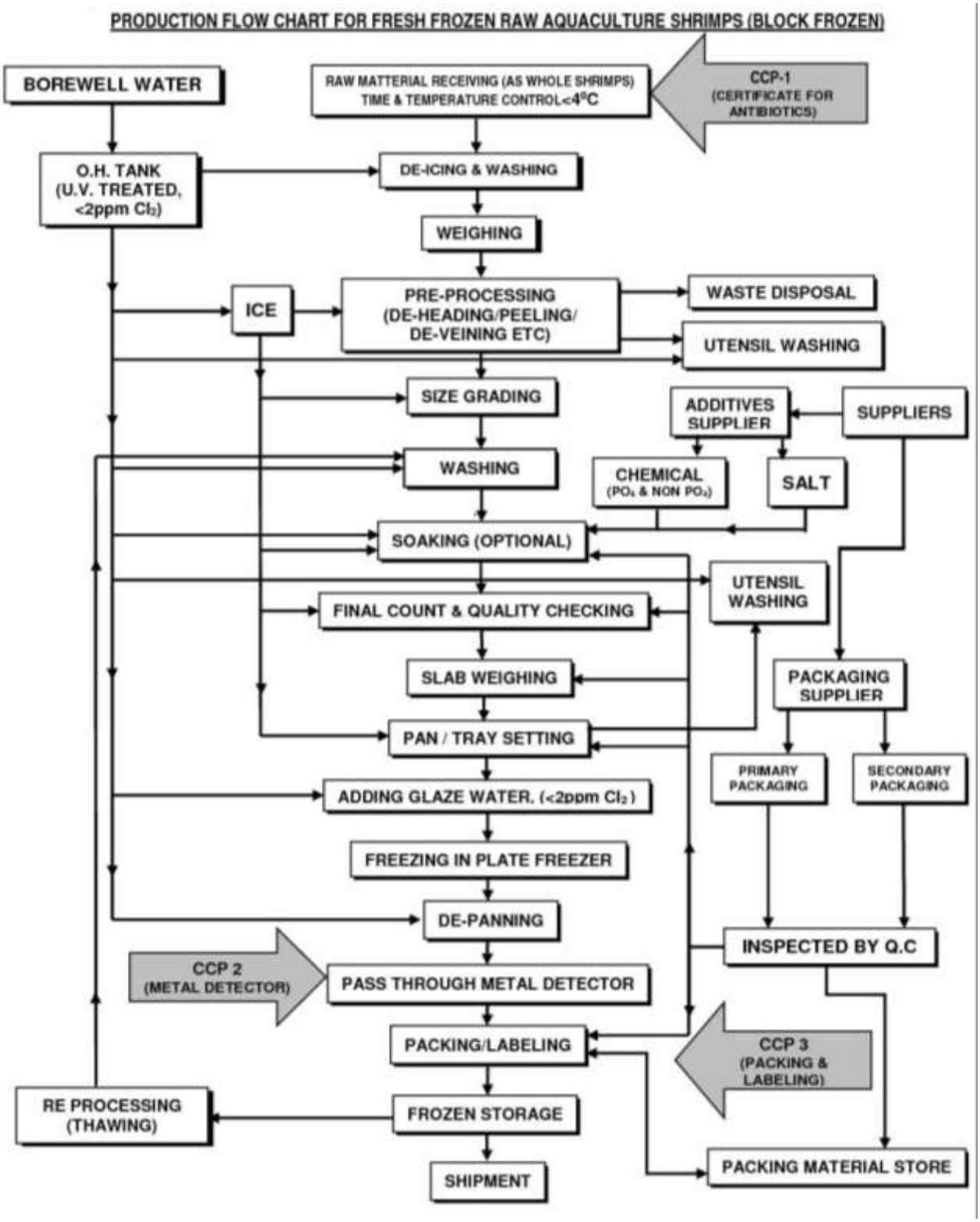
II. Production Flow Chart for Fresh Frozen Raw Aquaculture Shrimps (Block Frozen)



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III. Processing Steps of Fresh Frozen Raw Shrimps (Process Description)

a) The heads alone of the prawns are removed, leaving the entire shells and tails intact;
b) The vein (intestine) is pulled out as far as possible from the severed head portion; hanging meat along with the red membrane is removed.
c) Washed well after de-heading;
d) Discolored, bruised and soft-shelled pieces at the grading time are discarded.
e) After grading, the HL/PUD/PD/PDTO are packed in doubly waxed duplex board cartons of 1.8 Kg/ pan of 2 Kg made of stainless steel (or as per buyers requirement) each with declared size, grade.
f) For peeled shrimps the shell is completely removed and either or vein is removed by sharp knife. Dehydrated & discolored smelling pieces are segregated and rejected.
g) Peeled material is thoroughly washed in perforated tub and re-iced properly.
h) Graded materials are packed in duplex cartons with top layered arranged up to 80/120 and jumble pack for 100/200.
i) Packing is in a parallel style with uniform arrangement, no cross packing.
j) Add ice cold glaze water (2 ppm chlorine);
k) In HL type of product, the flavor and nutrients is maximum due to the protection offered by the shell.

IV. On – Site verification of process Flow for Block Frozen Aquacultured shrimps

Whole shrimps are received at the receiving room through landing platform of Pre-Processing section. Each batch of raw materials are properly deiced and check temperature <4^{0}Cand washed with potable water. Materials supplied by different suppliers are tagged with labels with detailed information and certificate of antibiotics. Materials of a particular variety are accepted at a time after satisfying the raw material acceptance criteria (Appendix-III) and rejected the materials which are not satisfied the acceptance criteria. Rejected materials are taken in crates with tag rejected and handed over to the agent/supplier after the batch is over. Purchase supervisor accepts the materials based on accepting criteria and records his observation in the raw material receiving log (Annexure-I). After proper washing with chlorinated water of < 2 ppm. strength and weighing, the head on materials are adequately iced in sanitized crates and kept in the chilled room of pre-processing section, maintained the temperature below +4^{0}Cor sent to the preprocessing section directly, if no more balance material is there. This operation is completed within minimum time. A time temperature log for the chill room is maintained by the supervisor to keep a check on temperature abuse. At the time of de-heading or peeling etc., adequate and experienced workers are engaged to ensure quick completion of the activity. During the operation, adequate flake ice is used to maintain the temperature below +4^{0}C. The headless or peeled materials are further washed with Chlorinated water of <2 ppm. Strength and adequately iced in sanitized crates. Raw material samples are drawn for microbiological/antibiotic test as per the schedule.
After receiving in the processing section, prior to grading each crate of material is de-iced and washed with chlorinated potable water. To minimize the cumulative exposure of material to high temperature, delay during manual grading is avoided. The graded materials are adequately iced and kept in plastic crates. To avoid time temperature abuse, excess materials are stored in the chill room or insulated boxes in the processing section with adequate ice. For time temperature log of chill room maintained to keep a check of temperature abuse.

The graded headless materials are deiced and taken for wash to remove the filth. In case of peeled materials, after deicing the materials are fed into the automatic grading cum filth washing machine to remove the filth. Prior final weighment of the slabs each individual grade of single variety is washed with chlorinated water <2 ppm. Strength and taken on perforated table to drain out the excess water. At this stage the code slip in addition to the mandatory information also incorporated.

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Before weighing, the materials are taken for final grade checking and colour segregation. Following weighing, slabs are taken to a setting table to arrange the materials in pan/inner cartons. Technologists inspect the processed slabs to check the count, weight and other quality parameters and record the observation in the register of processing (Annexure-III)

After packing chilled glaze water with < 2 ppm. Chlorine level is poured into the slabs. These slabs then taken to pre-cooled plate plate freezer for freezing. The slabs are frozen at - 40^{o}C in 90 minutes. A logbook for plate freezer is maintained by the production supervisor to ensure the proper freezing of the materials (Annexure-XV).

Upon unloading, slabs are taken to the anteroom for final packing. Hardness of slabs are checked. Ante room temperature is always maintained. Properly dressed store boys are allowed to handle the finished products. In case of pan freezing, slabs are taken out with depanning machine and packed in laminated inner carton. All slabs are put into master carton bearing describe packing, declaration for particular varieties as per requirements.

Following the days production, the product is tested code wise, type wise of Organoleptic and Bacteriological examination by approved technologist (Lab). The same are recorded (Annexure-XVIII, XIX, XX, XXI, XXII,). A particular lot is approved for shipment if the lot satisfies the quality criteria of the competent authority and that of the importing country.

Besides as per our practice samples are drawn randomly for test of antibiotic residue to a level of 0.1 ppb by HPLC-LCMSMS Method particularly for chloramphenicol and nitrofuran groups in EIC approved Laboratory. Records are maintained by technologists. For any type of products, materials are accepted on supplier's guarantee. Pesticides, antibiotics drug and heavy metals (Hg, As, Cd, Pb, Ni, Cr & Sn) salts and STPP are tested as follows:

Antibiotics, Heavy Metals and Pesticides residue is tested at EIC approved LAB for raw material once in two months and covering different sources/suppliers on rotation basis and also finished products testing is done consignment-wise before each shipment.

SALT-Salt is tested for staphylococcus and sulphite reducing clostridium once in six months if same batch is continued otherwise tested every batch at EIC approved laboratories.

STPP-The permissible percentage of phosphate in finished products are tested once in six month by EIC approved laboratory. Antibiotics, Heavy Metals and Pesticides are sent to EIA / SEA LAB/TA LAB/INTERFIELD LAB for residue analysis as specified by the local EIA for which the sample is drawn by EIA.

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V. Hazard Analysis Worksheet for Fresh Frozen Raw Shrimps (Block Frozen)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

*Approval No.***370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **BLOCK FROZEN (H/ON, H/L, PD, PUD, PDTO, EZPEEL) AQUACULTURED SHRIMP**
Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ingredients /processing step	**Identity potential hazards introduced/ controlled or enhanced at this step**	**Are any potential food safety hazardous significant? (yes/no)**	**Indicate likelihood & severity of hazard, high-h; medium-m; Low-l**	**Justify your food safety hazards for column 3**	**What control critical decision measures can be applied for the significant hazards**	**Is this step CCP/CQP (yes/no)**
Receiving whole shrimps at raw material receiving section	<u>Biological</u> Bacterial pathogen growth	Yes	Likelihood-H Severity-H	Raw materials are always having high load of pathogen	Proper time temperature control Raw materials temp <4^{0}C if more reject the lot. Controlled by GAP at farm. GMP SSOP SOP at processing plant.	Yes CCP-1

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chemical Antibiotic residue listed in BAP manual Annex-5, Table -II Pesticide sulphite	Yes	Likelihood-H Severity-H	Antibiotic residue/pesticide residue/sulphite residue are toxic & potential allergen and that may cause cancer.	(1) Pre-harvesting certificate (for EU) from MPEDA authorize Lab. For antibiotics in-house test by ELISA kit.(Non EU countries) .**Also for residues of the aquaculture drugs listed in Annex 5, Table II as appropriate for the species. Once in two month interval for pesticides and Heavy metals. (2) Supplier Declaration	Yes CCP-1
	Physical Metal fragment, stone, plastic, wood & objection able foreign materials	No	Likelihood-L Severity-H	All sorts of physical contamination are possible & cause injuries to consumer acceptance.	……	No
	Quality Organoleptic	No	Likelihood-M Severity -L	Affects finished products quality due to improper handling, lack of improper icing, improper storage in crates	…….	No
Deicing, washing, Weighing	Biological Bacterial pathogen growth	No	Likelihood-M Severity -H	From food contact surfaces, workers handling, time delay, temperature fluctuation. proper layer icing, maintained temperature below 4^0C	……	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Nil	No	…….	No physical contamination at this step	……	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Quality organoleptic	No	Likelihood –L Severity - L	Maintain raw material temperature below 4^0C	……..	No
Re-icing/ chill room	**Biological** Bacterial pathogen	No	Likelihood-L Severity -L	Proper time temperature control (SSOP) Food contact surfaces Contaminate ice may cause pathogen growth.	…….	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Foreign material	No	Likelihood-L Severity -H	From food contact surface like broken plastic & metal pieces etc.	…….	No
	Quality Temperature	No	Likelihood-L Severity -M	From temperature abuse of the raw material may affect the quality.	…….	No
Deheading /peeling/de veining/filt h washing etc.	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food contact surface, time temperature control, proper layer icing & using chill water.	…….	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	…….	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No
	Quality Organoleptic	No	Likelihood-L Severity-L	Hanging meat / red meat may affect consumer acceptance. proper trimming of red meat, SOP if Deheading procedure	…….	No
Deicing & size grading	**Biological** Bacterial pathogen	No	Likelihood –L Severity -H	From food contact surface & personnel hygiene, proper time /temperature control. Proper icing of grading materials.	…….	No
	Chemical Nil	No	…….	No source chemical contamination.	…….	No
	Physical Nil	No	…….	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No
	Quality Organoleptic	No	Likelihood-L Severity -M	Wrong grading, defective/wrong pieces may exceed the specification, /uniformity ratio. Proper sorting /checking using trained man power. Proper labeling of source code.	…….	No
Additives inspection	**Biological** Bacterial pathogen	No	Likelihood-L Severity -H	In salt clostridium bacteria may be chance. Lot wise analysis of clostridium bacteria by external lab.	…….	NO

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chemical Food grade	No	Likelihood-L Severity -H	Salt & carnal might have health hazards chemicals. MSDS /food grade certificate from manufacturer/ suppliers.	……..	No
	Physical Pest infestation	No	Likelihood-L Severity -H	From pest infestation & other physical character may affect quality of the products.	……	No
	Quality Free flow, moisture, appearance	No	Likelihood –L Severity -H	Quality of salt, carnal additives is inspected as per sampling plan & recorded.	…….	No
Treatment	**Biological** Bacterial pathogen	No	Likelihood-L Severity-H	May contaminated water causes pathogen growth. Proper schedule & monitoring of hygiene & sanitation activity, time /temperature control.	……	No
	Chemical Salt, carnal	No	Likelihood-L Severity- H	Excess salt & phosphate residue may lead to buyer non-acceptance. Use of quantified chemicals, adherence to treatment specs and issue register & also additional checking to be done.	……	No
	Physical Nil	No	……	No source of physical contamination	……	No
	Quality organoleptic	No	Likelihood-L Severity-H	Treatment may generate defective pieces. Gentle agitation through agitator & trained employees involved in this process. Excessive use of chemical will lead to bitter test and loss of texture.	…….	No But this step considers as CQP.
Washing/Draining/Final count & sorting	**Biological** Bacterial pathogen	No	Likelihood-H Severity-H	From food handler's personnel hygiene & food contact surface. All food handlers should be checked personnel hygiene and the same recorded. Food contact surface sanitized as written procedure.	……..	No
	Chemical Nil	No	……	No chemical contamination at this step.	…….	No
	Physical Nil	No	.....	From food contact surface, from food handlers. crates & nets are made by as per policy monitoring & verification (broken & damaged in place and also to avoid metal fragment table to make by SS. To avoid unsecure jewelry all food handler is checked before enter the processing area and recorded the same.	……	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Quality Organoleptic	No	Likelihood –L Severity-L	More defective pieces may be going to on slab. Trained /skilled employees are provided to check the defective pieces. Randomly checking of pre freezing inspection & same to be recorded.	…….	No But this step considers as CQP
Weighing /pan setting and glazing	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food contact surface of pan, lids etc. From Personnel hygiene of food handlers. Proper cleaning & sanitization of pan lids & polythene cover. Periodical hand sanitation.	…….	No
	Chemical Nil	No	……	No source of chemical contamination.	…….	No
	Physical Nil	No	……	No source of physical contamination.	……..	No
	Quality Organoleptic	No	Likelihood –L Severity-L	Improper arrangement may affect customer satisfaction. Top & bottom flat setting.	……..	No
Freezing	**Biological** Nil	No	……	No biological contamination in this step -4^{0}Cfreezing activity in place.	……	No
	Chemical Nil	No	……	No source of chemical contamination.	…….	No
	Physical Nil	No	…….	No source of physical contamination.	…….	No
	Quality Improper freezing	No	Likelihood-L Severity-H	Time & temperature fluctuation of block freezers may lead in to improper freezing.	……..	No But this step considers as CQP
De Panning	**Biological** Bacterial pathogen	No	Likelihood-H Severity-H	From food contact surface pan, lid covers, personnel. Use only sanitized pan cover, lids etc. Proper hand washing.	…….	No
	Chemical Nil	No	……	No source of chemical contamination.	……	No
	Physical Nil	No	……	No source of physical contamination.	…….	No
	Quality Nil	No	…….	Due to over defrosting glaze will affect. Ensure the uniform spray of water.	…….	No
Metal detector	**Biological** Nil	No	……	No source of microbial contamination.	…….	No
	Chemical Nil	No	……	No source of chemical contamination.	……	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Metal fragment	Yes	Likelihood-L Severity-H	Metal fragments may contaminate the product. It is hazardous to health.	Continuously all pouches pass through metal detector & record is maintain for the same. Metal detector is periodically calibrated as per written procedure.	Yes CCP-2
	Quality Nil	No	……..	…….	……	No
Packing material inspection	**Biological** Nil	No	…….	Internal bacteriological report.	……	No
	Chemical Toxic printing ink	Yes	Likelihood-L Severity- M	Toxic printing ink may cause health hazard	No toxic printing ink used in printing & food grade materials are used.	No
	Physical Damage	No	Likelihood-L Severity-M	Damage packing materials from suppliers. External quality report for packing material. Declaration from manufacturer/Supplier.	……..	No
	Quality Quality of packing material	No	Likelihood-L Severity-M	Poor quality of packing material may affect the customer satisfaction. External quality report for packing material. Declaration from manufacturer /supplier.	……	No
Label inspection /Packing	**Biological** C.Botulinum Allergen	Yes yes	Likelihood – H Severity -H	c.botulinum toxin formation during storage. Crustaceans are one of the major allergen.	Keep frozen at or below -18^{0}C All finished products labeled with" containing" shrimp.	Yes CCP-3
	Chemical Toxic printing ink	Yes	Likelihood-L Severity- M	Toxic printing ink may cause health hazard	No toxic printing ink used in printing & food grade materials is used.	No
	Physical Foreign material	No	Likelihood-L Severity-M	From foreign matters like rubber, staple pin, sign of pest infestation to avoid the foreign matters packing material inspection to be carried out as per sampling plan.	……	Yes CCP-3

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Quality Quality of labels	No	Likelihood-L Severity -L	Poor quality printing, poor presentation of label may affect the customer specification. Label inspection to be carried out and compare with matter label.	…….	No
Cold storage	**Biological** Nil	No	…….	Not likely to occur because of cold storage are designed & maintained. Time & temperature monitoring & recording physical verification.	……..	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Temperature	No	Likelihood-H Severity-H	Temperature fluctuation from cold store may affect the product quality. Cold store temperature is maintained at -18^{0}C. Automatic temperature monitoring device connected with computer.	……	No
	Quality Appearance	No	Likelihood-H Severity- H	Improper maintenance of cold store may affect the quality of the product. Cold store is properly maintained FIFO system is followed.	…….	No
Shipment	**Biological** Nil	No	…….	Final product covered with protected polythene/ inner carton/ master carton and closed with self-adhesive tape.	…….	No
	Chemical Nil	No	……..	No chemical contamination in this step.	……	No
	Physical Nil	No	……	Not likely occur because frozen storage is maintained at -18^0 c temperature.	……	Nil
	Quality Temperature abuse and Improper handling	No	Likelihood-L Severity-L	Improper handling, temperature abuse and carton quality design, product may affect the customer satisfaction. Monitoring of incoming cartons, loading operation & temperature recording.	……	No But this step considers as CQP.

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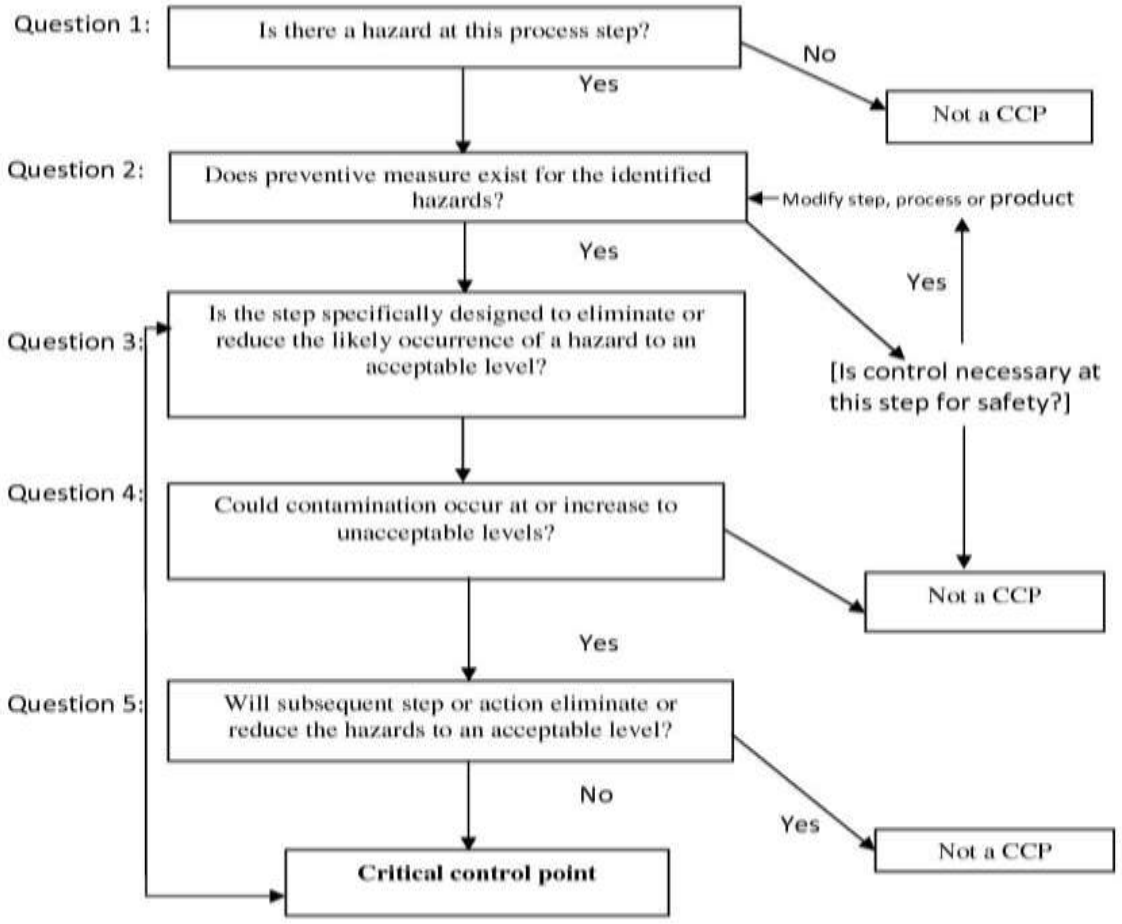
VI. CCP - Decision Tree



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VII. CCP - Decision Tree Analysis

The decision tree is applied to all steps of hazard analysis worksheet and not limited to CCP alone. Following is CCP determination for block raw frozen aqua-culture shrimps:

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Raw material receiving	**Biological** -pathogen **Chemical** -Antibiotic(Annex-5 table –II of BAP Manual) -pesticides -Sulphite -Herbicides **Physical** -Glass -wood -stone -plastic **Quality** -Black spot	 Y Y Y Y	 Y Y Y Y	 Y Y N N	 … … Y Y	 … … Y Y	 CCP CCP … ….	Survival of pathogenic bacteria from harvesting area at farm. Farm shrimps may have sulphite, pesticides, herbicides & antibiotic residues. It may cause illness to the consumer. Sulphite agents may cause allergic type reaction. There is no further step to control the hazard. ** residues of the aquaculture drugs listed in Annex 5, Table II as appropriate for the species …….. ……
Chill storage	**Biological** -Pathogen **Chemical** Nil **Physical** Nil **Quality** Nil	 Y … … …	 Y …. ….. ….	 N …. …… ….	 Y ….. …. ….	 Y …. …. ….	 …. …. …. ….	 ….. …… …… …….

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Deicing/washing	**Biological** -Pathogen	Y	Y	N	Y	Y	…..	……..
	Chemical Nil	…	….	….	….	…..	…..	……..
	Physical Nil	….	……	….	…	….	……	……
	Quality Organoleptic	Y	Y	N	Y.	Y	….	…….
Deheading	**Biological** Pathogen	Y	Y	N	Y	Y	…..	…….
	Chemical Nil	….	….	….	…..	….	….	…….
	Physical Nil	….	….	…..	….	…..	…..	……
	Quality Organoleptic	Y	Y	N	Y	Y	……	……..

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Grading	**Biological** Pathogens	Y	Y	N	Y	Y	….	……
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Organoleptic	Y	Y	N	Y	Y	…..	…….
Peeling	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Organoleptic	Y	Y	N	Y	Y	Not a CCP	…….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Washing	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Nil	 Y …. …. ….	 Y …. …. …	 N …. ….. ….	 Y …. ….. ….	 Y …. ….. …..	Not a CCP ….. ….. …..	…… …….. …… …….
Additives inspection	**Biological** Pathogens **Chemical** -phosphate -salt **Physical** Nil **Quality** Nil	 Y Y …. ….	 Y Y …. ….	 N N ….. …..	 Y Y ….. ….	 Y Y ….. …..	Not a CCP Not a CCP ….. …..	….. ……. …… …….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Treatment	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical -phosphate	Y	Y	N	Y	Y	Not a CCP	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Organoleptic	Y	Y	Y	N	N	CQP	Excess residue of phosphate may lead to no acceptance.
Final checking/weighing	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Organoleptic	Y	Y	Y	N	N	CQP	Defective pieces may be fed in to block

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Label Inspection	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Nil	 Y …. …. ….	 Y …. …. …	 N …. ….. ….	 Y …. ….. ….	 Y …. ….. …..	Not a CCP ….. ….. ….. …..	…… ……. …… …….
Pan setting	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Nil	 Y …. …. ….	 Y …. …. …	 N …. ….. ….	 Y …. ….. ….	 Y …. ….. …..	Not a CCP ….. ….. ….. …..	…… ……. …… …….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Freezing	**Biological**						Not a	
	Pathogens	Y	Y	N	Y	Y	CCP	…..
	Chemical							
	Nil	…	….	…	….	….	….	…….
	Physical	….	….	…..	…..	…..	…..	……
	Nil							
	Quality							Improper freezing affects the product & buyer acceptance.
	Improper freezing	Y	Y	Y	N	N	CQP	
De panning	**Biological**						Not a	…..
	Pathogens	Y	Y	N	Y	Y	CCP	
	Chemical							…….
	Nil	….	….	….	….	….	…..	
	Physical							……
	Nil	….	….	…..	…..	…..	…..	
	Quality						Not a	…….
	Slab size & Appearance	Y	Y	N	Y	Y	CCP	

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Metal detector	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Metal fragment	Y	Y	Y	N	N	CCP-2	Metal fragments may come into product.
	Quality Nil	….	….	….	…	….	……	…….
Packing material inspection	**Biological** Pathogens	Y	Y	N	Y	Y	CCP-3	
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Quality of packing material	Y	Y	N	Y	Y	Not a CCP	…….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Packing /Labeling	**Biological** (Allergens)	Y	Y	Y	Y	Y	CCP-3	C.botulinum may cause to harm consumers. Crustaceans are one of the major allergen that may allergic to some consumer.
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Improper labeling	Y	Y	Y	N	N	CQP	Improper labeling will lead to wrong identification of product.
Cold storage	**Biological** Nil	….	….	…..	…..	….	……	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Organoleptic	….	….	….	….	…	…..	……..

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(Managing Director)

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Shipment	**Biological** Nil	….	….	…..	…..	….	……	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Damage carton	Y	Y	N	Y	Y	CQP	Improper labeling, temperature abuse & carton quality may damage product.

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VIII. Justification of CCP Blocks Freezing (Aquaculture)

Process step	CCP	Justification	
CCP-1 Raw material shrimps	Growth of pathogen	Growth of microbial pathogen	This is the last stage at which hazards can be controlled; hence this step is Critical Control Point. (CCP)
	Antibiotics	Presence of antibiotics reduces the resistance of immune system of human body, **(residues of the aquaculture drugs listed in Annex 5, Table II as appropriate for the species)	
	Pesticides	Presence of pesticides causes cancer in the lungs run in human body.	
	Sulphite	Presence of sulphite causes allergy to some consumer.	
	Herbicides	Presence of herbicides such as pendimethiline which causes severe illness to consumer.	
CCP-2 Metal Detection	Metal fragment	Presence of metal causes physical injury to the consumer.	This is the last stage at which hazards can be controlled; hence this step is Critical Control Point. (CCP)
CCP-3 Packing/Labeling	***Clostridium botulinum*** toxin formation during storage.	***C. botulinum*** toxic formation during finished product storage which leads to symptoms like weakness, vertigo, swallowing and frequently abdominal swelling, consumption, paralysis & death.	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)
	Shrimps (Crustaceans)	Crustaceans (shrimps) are one of the major allergens. It may causes allergy to some consumer,	

IX. Justification of Block Freezing Aquaculture (Critical Limit)

PROCESS STEP	CCP	CRITICAL LIMIT	REFERENCE
CCP-1 Raw material Receiving	Growth of microbial pathogen.	Temperature of the material should be <4^{0}C	USFDA Regulation and Codex Alimentarius guidelines 5.3(CAS.RCP 1-1969, Rev. 4-2003) & as per BAP standard Annex5, Table -II Detection Limit: Chloramphenicol: 0.3ppb Nitrofuran :1.0ppb Sulphonamide :No residue permitted Oxy tetracycline :No residue permitted Tetracycline : :No residue permitted Malachite green :No residue permitted Lueco malachite green :No residue permitted Quinolones : :No residue permitted Flouroquinolones :No residue permitted
	Antibiotics	**Maximum permissible limit** Chloramphenicol - Nil Nitrofuran -Nil Oxytetracycline -Absent Sulphonamide -Absent Malachite Green - ND Leuco Malachit Green – ND Quinolones – ND Oxy tetracycline – ND Tetracyline –ND Flouroquinolones –ND	
	Pesticides	**Maximum permissible limit** BHC, Aldrin, Dieldrin 0.3 ppb DDT 5.0ppm	
	Sulphite	Maximum permissible limit is – Nil	
	Herbicides	Maximum permissible limit is – Nil	
CCP-2 Metal Detector	Metal fragment	Ferrous :1.5mm Nonferrous :2.0mm Stainless Steel: 2.0mm	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003)
CCP-3 Labeling /Packing	Finished product Storage (***Clostridium botulinum***)	Maximum cooler temperature -18^{0}C	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003)
	Crustaceans (shrimps)	Crustaceans are one of the major allergen.	USFDA Food Allergen Labeling and Consumer Protection Act of 2004 (Public Law 108-282, Title II)

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X. Justification of CQP (Block Freezing)

PROCESS STEP	HAZARDS	CRITICAL LIMIT	JUSTIFICATION
CQP-1 Chemical treatment	Residual phosphate in excess of the critical limit.	5000ppm	Agreement with buyers.
CQP-2 Final checking	Organoleptically defective pieces.	As per finished product specification.	Agreement with buyers
CQP-3 Freezing	Improper freezing.	Core temperature of product must be not less than -18^0C	In-house /industry specification.
CQP-4 Weighing/packing /labeling	1.Short weight 2. Wrong labeling/packing.	As per buyer's specification.	Agreement with buyers
CQP-5 Shipment	1. Core temperature of product while loading. 2. Master carton quality while loading.	Must not be less than -18^0C. Damaged /quality compromised cartons.	In-house/industry/Buyer's specification.

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(Managing Director)

XI. HACCP (CCP) Plan Form for Aquaculture Shrimps (Block)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

Approval No.**370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **BLOCK FROZEN**
(H/ON, H/L, PD, PUD, PDTO, EZPEEL) AQUACULTURE SHRIMP

Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		
CCP-1 Raw material head on receiving stage	**<u>Antibiotics</u> Chloramphenicol Nitrofuran & Nitrofuran metabolites (AOZ, AMOZ, AHD, SEM) Tetra cycline Oxytetracycline Sulphonamides Malachite Green Lueco Malachite green Quinololones Flouro quinolones.**	**Absent**	**Presence of antibiotics.**	**Pre harvesting test certificates from competent Lab. (for EU countries). In–house ELISA test done for the receiving raw material (for non EU countires)** **Ensure supplier declaration certificate.** **Antibiotic testing of material through internal lab & once in two months from external competent lab.**	**Every lot received and each consignment wise and code wise.** **Each supplier provides declaration at the time of delivery of material.** **External testing once in two months to cover all suppliers.**	**Q.C Technologist**	**Reject lot if not accompanied by certificate. Stop all purchases from supplier if tests are positive.** **Remove the supplier from approved supplier list if it is positive, action will be taken against supplier. If it is positive, action will be taken against suppliers. Remove the supplier from approved list.**	**Antibiotic test reports.** **Supplier declaration .**	**1.Verification of monitoring records within 7 days by Q.A manager. 2. Raw material analysis report. (testing in an EIC approved lab once in two months for antibiotics. 3.Consignment wise checking of antibiotic in finished product in an EIC approved lab. 4. Supplier guarantee letter. 5. ELISA antibiotic testing.**

1	2	3	4					5	6
	<u>Pesticides & Herbicides</u> **BHC, ENDRIN DEILDRIN, ALDRIN, DDT, PENDIMETHALIN**	**Absent**	**Presence of pesticides**	**Declaration from supplier for non-usage of pesticides and other banned chemical.**	**Daily source of raw material testing.**	**Q.C Technologist**		**External test report for pesticides once in a two month**	**Review the external lab reports done once in two months** **BHC, Endrin, Dieldrin,** **Aldrin :10 ppb** **DDT :10ppb** **Pendimethiline :10 pbb**
	<u>Sulphite</u>	**Absent**	**Residue of sulphite content.**	**Do the sulphite analysis test.**	**Each lot of raw material received.**	**Q .C Technologist**		**Sulphite test record.**	**Review sulphite analysis test report.**
	<u>Biological</u> **Growth of microbial pathogen**	**Temperature of raw material should be <4^{0}C**	**Temperature of raw material**	**By thermometer**	**Each lot of raw material received**	**Q .C Technologist**	**Reject the lot if raw material temperature is >4^{0}C**	**Raw material receiving register.** **Bacteriological register.** **Thermometer calibration record.**	**Review of the:** **Raw material temperature records.** **Bacteriological register** **Thermometer calibration record.**
CCP-2 Metal	**Metal fragment**	**Fe :1.5mm** **Non**	**Metal fragments**	**Each block passing through metal**	**Continuously**	**Packing supervisor**	**The detected slab is removed**	**Metal detector**	**CCP-2 verification of metal**

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1	2	3	4					5	6
detection		Fe:2.0mm SS:2.0mm		detector			and put in a locked box. The production manager /general manager unlock the box and defrost the slab. Divided in to 4 parts. Pass each individual piece through metal detector. If any individual detected, take the pieces cut with knife and analysis metal fragment. Then take out defected pieces. Before passed slab also take & recheck /pass through metal detector.	records.	detection Before starting the process pre operation checking has done with standard test pad then also periodically verification carried out every 30 minutes. Verification done once in a week.
CCP-3 (Packing & Labeling)	Shrimps,	All finished product labeled with "containing shrimps"	Finished product labeling statement "contains	By visual	Label on each carton	Supervisor/ QA/ QC / Production In-charge/ Package	Segregation of the lot at re-labeling	Label approval record	Review in once in a week

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1	2	3	4					5	6
	***C.botulinum toxin* formation during finished product storage.**	**All finished product labeled with "Keep Frozen at below -18^{0}C"**	**Shrimp" "Keep Frozen at or below -18^{0}C"**			**executive/ Managing Director**			

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XII. HACCP (CQP) Plan Form for Aquaculture Shrimps (Block)

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		
CQP-1 Chemical treatment	Phosphate residue	Max. 5000 ppm	Phosphate residue testing.	Chemical analysis through strip method.	Daily source wise.	Q.C Technologist	If phosphate exceeds limit label on the master carton level of ppm	Soaking monitoring records.	Phosphate residual reports are verified by Q.A manager.
CQP-2 Final checking	Organoleptic	20%	Checking of defective pieces.	By online checking.	continuously	Q.C Technologist	Continuous training to improve skill.	pre-freezing inspection record(Block)	Daily verification of pre freezing inspection record.
CQP-3 Freezing	Improper freezing	Min -18^{0}C	Temperature monitoring of frozen products.	Check freezing time and core temperature of product.	continuously	Production supervisor.	Segregate improperly frozen product & re-freeze.	Monitoring record for freezing block.	Daily verification of freezing monitoring record.
CQP-4 Weighing/ packing /labeling	Wrong labeling & packing	Nil	Labeling & packing operation.	by visual check of packing process	continuously	Production & packing supervisor	Check for any mislabeling, printing and correct it.	Block packing record.	Daily verification of packing record.
CQP-5 Shipment	Temperature	-18^{0}C	Monitoring loading temperature	Check temperature of container & cargo.	Every shipment	Cold store supervisor / Q.C technologist	Stop loading until the temperature is achieved.	Shipment details record.	Q.A to verify shipment detail record for each shipment.

XIII. Predetermined Corrective /Preventive Action

A. When Antibiotic/Sulphite Residue (CCP-1) Exceed Critical Limit

a) Immediate corrective action:

Identify affected lots through, traceability, source code and withdraw day code and withdraw all such lots from the processing floor as well as cold stores.

Tally the total withdrawn lots for quantity.

b) Preventive action:

The supplier is traced back from the traceability, source –code and /or day code and removed from approved suppliers list to get rid of unworthy business alliance (his supplier declaration proves his untrustworthiness)

c) Corrective action records:

CCP verification & corrective action reports for Antibiotic and sulphites.

B. When Metal Detection Exceed (CCP-2) Critical Limits

a) ***Immediate corrective action:***

The detected pouches /slabs are keeping as non-conformance in de marked cold store area.

b) ***Preventive** action:*

The entire process line is traced and checked thoroughly for any possibility of loose metal, rust scrap etc. and any such situation upon notice are corrected.

c) ***Corrective action records:***

An NCR is raised and corrective action with regard to the same is reported back using the CCP verification and corrective action format for metal detector.

C. When Packing & Labeling (CCP-3) Critical Limits

a) Immediate corrective action:

Segregate and return or destroy any label stock or pre- labels packing stock that does not contain the proper statement. Determine and correct the cause of improper labels.

b) Preventive action:

i. Finished products label for the presence of a “keep frozen” & “contains shrimps” statement.

ii. Visual examination.

iii. Representative number of package from each lot products.

iv. Any person who has an understanding of the natural of controls.

***c) Corrective** action record:*

Record of labeling checks.

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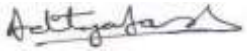

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14. Fresh Frozen Raw Aquaculture Shrimps (IQF)

I. Product Description of Raw Frozen Aquaculture Shrimps (IQF)

Source of Raw Material	Fresh raw material purchased from approved suppliers (Aquaculture material)
Product	IQF Raw Shrimps
Varieties	Head on – shrimps (H/on)
	Headless Shell-on Shrimps (HL, EZ PEEL)
	Peeled Deveined Tail-on (PDTO, Round-cut)
	Peeled Deveined Tail-on (BUTTERFLY 90% Cut)
	Peeled Un-Deveined Tail-off (PUD, Round-cut)
Packing	4 x 2.5Lbs, 10x2Lbs, 6x1.2Kg,6x1Kg, 10x2lbs, etc., (Type of pack and Pouch / M/c as per buyer's requirements)
Storage conditions	-18 Degree centigrade
Shelf life of the product	24 months from the production date or as per the specification of Importing countries.
Method of Preservation	Individual Quick Freezing(IQF)
Additives used	Salt and Sodium-Tri-Poly-Phosphate(STTP) as per buyer's requirement
Distribution	To all countries by refrigerated carriers (Including E.U Countries, Russian Federation & Australia)). If we exported uncooked prawns to Australia, each batch tested on arrival in Australia and found to be free of WSSV and YHV. When we export the products for Russian Federation the sample is free from manmade radionuclide contamination. Sample is fit for human consumption from radiological point of view.
Intended use by customer	To be consumed by general public **(Crustaceans) contain Allergens** When thawing, we recommend …. Place Bag of shrimps overnight into the refrigerator or empty desire amount into a container of cool water for approximately 5 minutes' drain. It's now ready for cooking. Re-freezing thawed product is not recommended.

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II. Production Flow Chart for Fresh Frozen Raw Aquaculture Shrimps(IQF)

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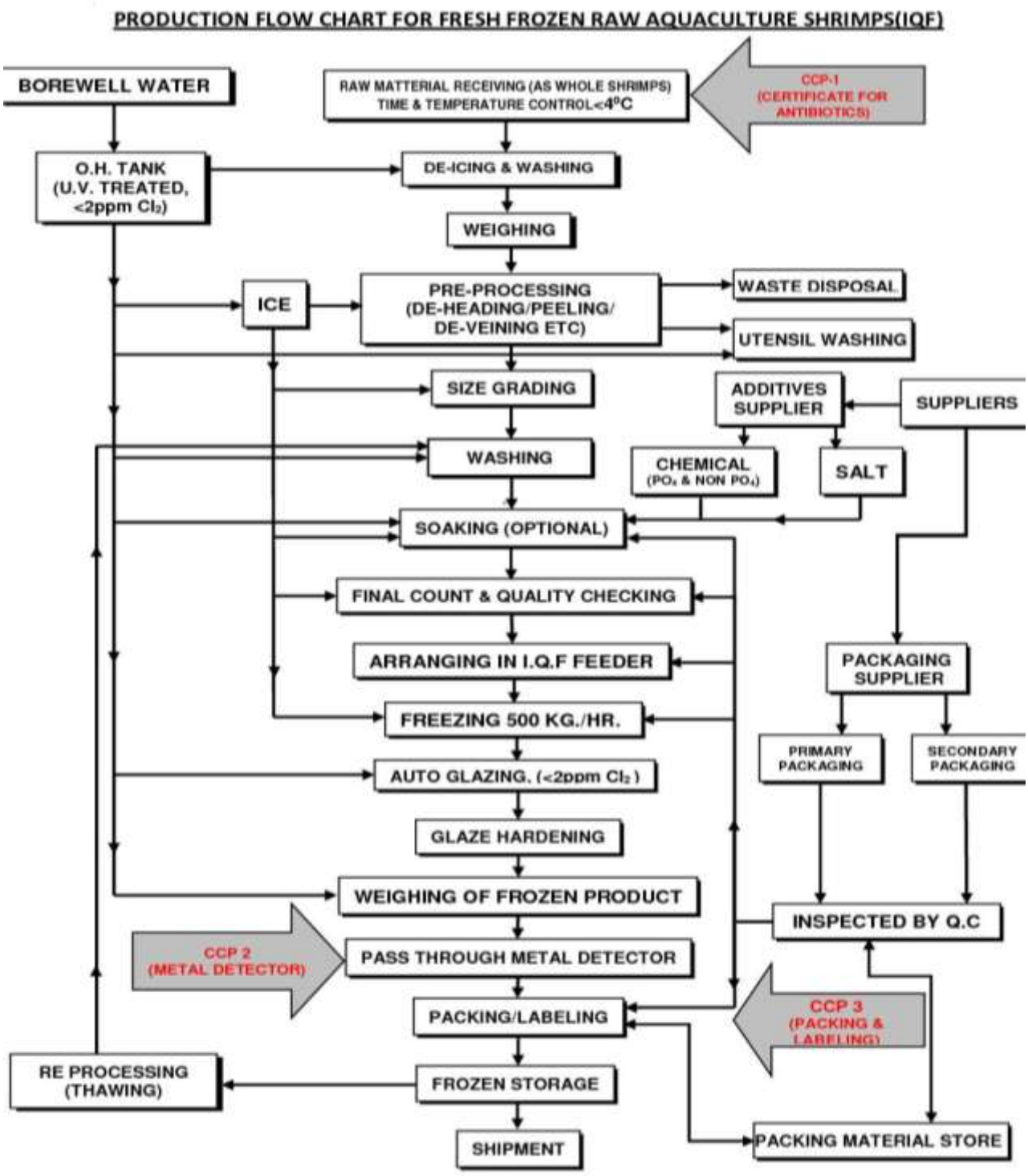

III. Processing Steps of Fresh Frozen Raw Shrimps (Process Description)

The heads alone of the prawns are removed, leaving the entire shells and tails intact;

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The vein (intestine) is pulled out as far as possible from the severed head portion; hanging meat along with the red membrane is removed.
Washed well after de-heading;
Discolored, bruised and soft-shelled pieces at the grading time are discarded.
For IQF products, size, grade and variety-wise the materials are graded and soaking (optional) with 2% salt, 3% STPP, 40% Water and 60% Ice and stirring for 1 and ½ hour) and then fed to the IQF feeder individually before freezing and then only the frozen products are weighed, glazed and packed as per buyer's requirement.
For peeled shrimps the shell is completely removed and either or vein is removed by sharp knife. Dehydrated & discolored smelling pieces are segregated and rejected.
Peeled material is thoroughly washed in perforated tub and re-iced properly.
Graded materials fed to the IQF feeder individually before freezing and then only the frozen products are weighed, glazed and packed as per buyer's requirement.
In HL type of product, the flavor and nutrients is maximum due to the protection offered by the shell.

IV. On – Site verification of process Flow for IQF Aquacultured shrimps

Whole shrimps are received at the receiving room through landing platform of Pre-Processing section. Each batch of raw materials are properly deiced and check temperature <4^{0}C and washed with potable water. Materials supplied by different suppliers are tagged with labels with detailed information. Materials of a particular variety are accepted at a time after satisfying the raw material acceptance criteria (Appendix-III) and rejected the materials which are not satisfied the acceptance criteria. Rejected materials are taken in crates with tag rejected and handed over to the agent/supplier after the batch is over. Purchase supervisor accepts the materials based on accepting criteria and records his observation in the raw material receiving log (Annexure-I). After proper washing with chlorinated water of < 2 ppm. strength and weighing, the head on materials are adequately iced in sanitized crates and kept in the chilled room of pre-processing section, maintained the temperature below +4^{0}C or sent to the preprocessing section directly, if no more balance material is there. This operation is completed within minimum time. A time temperature log for the chill room is maintained by the supervisor to keep a check on temperature abuse. At the time of Deheading or peeling etc., adequate and experienced workers are engaged to ensure quick completion of the activity. During the operation, adequate flake ice is used to maintain the temperature below +4^{0}C. The headless or peeled materials are further washed with Chlorinated water of <2 ppm. Strength and adequately iced in sanitized crates. Raw material samples drawn for microbiological/antibiotic test as per the schedule.
After receiving in the processing section, prior to grading each crate of material is de-iced and washed with chlorinated potable water. To minimize the cumulative exposure of material to high temperature, delay during manual grading is avoided. The graded materials are adequately iced and kept in plastic crates. To avoid time temperature abuse, excess materials are stored in the chill room or insulated boxes in the processing section with adequate ice. For time temperature log of chill room maintained to keep a check of temperature abuse.
The graded headless materials are deiced and taken for wash to remove the filth. In case of peeled materials, after deicing the materials are fed into the automatic grading cum filth washing machine to remove the filth. Prior final weighment of the slabs each individual grade of single variety is washed with chlorinated water <2 ppm. Strength and taken on perforated table to drain out the excess water. At this stage the code slip in addition to the mandatory information also incorporated.
For IQF products the washed products are directly fed to the IQF feeder and after freezing the materials are weighed and glazed and then packed into the master carton as per the buyer's specification. Master Cartons are stored in cold storage maintained at below – 18^{0}C. Records of cold storage are maintained through an automatic temperature recording thermograph (Annexure-XXXV).

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Following the days' production, the product is tested code wise, type wise of Organoleptic and Bacteriological examination by approved technologist (Lab). The same are recorded (Annexure-XVIII, XIX, XX, XXI, XXII,). A particular lot is approved for shipment if the lot satisfies the quality criteria of the competent authority and that of the importing country.
Besides as per our practice samples are drawn randomly for test of antibiotic residue to a level of .01 ppb by HPLC-LCMSMS Method particularly for chloramphenicol and Nitrofuran groups in EIC approved Laboratory. Records are maintained by technologists. For any type of products, materials are accepted on supplier's guarantee. Pesticides, antibiotics drug and heavy metals (Hg, As, Cd, Pb, Ni, Cr & Sn) salts and STPP are tested as follows:

Antibiotics, Heavy Metals and Pesticides residue is tested at EIC approved LAB for raw material once in two months and covering different sources/suppliers on rotation basis and also finished products testing is done consignment-wise before each shipment.
SALT-Salt is tested for staphylococcus and sulphite reducing clostridium once in six months if same batch is continued otherwise tested every batch at EIC approved laboratories.
STPP-The permissible percentage of phosphate in finished products are tested once in six months by EIC approved laboratory. Antibiotics, Heavy Metals and Pesticides are sent to EIA / SEA LAB for residue analysis as specified by the local EIA for which the sample is drawn by EIA.

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V. Hazard Analysis Worksheet for Fresh Frozen Raw Shrimps (IQF)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

Approval No.**370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **IQF FROZEN**
(H/ON, H/L, PD, PUD, PDTO, EZPEEL) AQUACULTURED SHRIMP

Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
INGREDIENTS/PROCESSING STEP	**IDENTITY POTENTIAL HAZARDS INTRODUCED/ CONTROLLED OR ENHANCED AT THIS STEP**	**ARE ANY POTENTIAL FOOD SAFETY HAZADOUS SIGNIFICANT? (YES/NO)**	**INDICATE LIKELIHOOD & SEVERITY OF HAZARD, HIGH-H; MEDIUM-M; LOW-L**	**JUSTIFY YOUR FOOD SAFETY HAZARDS FOR COLUMN 3**	**WHAT CONTROL CRITICAL DECISION MEASURES CAN BE APPLIED FOR THE SIGNIFICANT HAZARDS**	**IS THIS STEP CCP/CQP (YES/NO**
Receiving whole shrimps at raw material receiving section	Biological Bacterial pathogen growth	Yes	Likelihood-H Severity-H	Raw materials are always having high load of pathogen	Proper time temperature control Raw materials temp <4^{0}Cif more reject the lot. Controlled by GAP at farm. ➢ GMP ➢ SSOP ➢ SOP at processing plant.	Yes CCP-1
	<u>Chemical</u> Antibiotic residue listed in BAP manual Annex-5, Table -II Pesticide sulphite	Yes	Likelihood-H Severity-H	Antibiotic residue/pesticide residue/sulphite residue are toxic & potential allergen and that may cause cancer.	(1) Pre-harvesting certificate from MPEDA authorize Lab. For antibiotics test report by ELISA kit. .**Also for residues of the aquaculture drugs listed in Annex 5, Table II as appropriate for the	Yes CCP-1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
					species. Once in two-month interval for pesticides and Heavy metals. (2) Supplier Declaration	
	Physical Metal fragment, stone, plastic, wood & objection able foreign materials	No	Likelihood- L Severity-H	All sorts of physical contamination are possible & cause injuries to consumer acceptance.	……	No
	Quality Organoleptic	No	Likelihood-M Severity -L	Affects finished products quality due to improper handling, lack of improper icing, improper storage in crates	…….	No
Deicing, washing, Weighing	Biological Bacterial pathogen growth	No	Likelihood-M Severity -H	From food contact surfaces, workers handling, time delay, temperature fluctuation. proper layer icing, maintained temperature below 4^0C	……	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Nil	No	…….	No physical contamination at this step	……	No
	Quality organoleptic	No	Likelihood –L Severity - L	Maintain raw material temperature below 4^0C	…….	No
Re-icing	**Biological** Bacterial pathogen	No	Likelihood-L Severity -L	Proper time temperature control (SSOP) Food contact surfaces Contaminate ice may cause pathogen growth.	…….	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Foreign material	No	Likelihood-L Severity -H	From food contact surface like broken plastic & metal pieces etc.	…….	No
	Quality Temperature	No	Likelihood-L Severity -M	From temperature abuse of the raw material may affect the quality.	…….	No
Deheading /peeling/deveining/filth washing etc.	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food contact surface, time temperature control, proper layer icing & using chill water.	…….	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	……..	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No
	Quality Organoleptic	No	Likelihood-L Severity-L	Hanging meat / red meat may affect consumer acceptance. proper trimming of red meat, SOP if Deheading procedure	…….	No
Deicing & size grading	**Biological** Bacterial pathogen	No	Likelihood –L Severity -H	From food contact surface & personnel hygiene, proper time /temperature control. Proper icing of grading materials.	…….	No
	Chemical Nil	No	…….	No source chemical contamination.	…….	No
	Physical Nil	No	…….	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No
	Quality Organoleptic	No	Likelihood-L Severity -M	Wrong grading, defective/wrong pieces may exceed the specification, /uniformity ratio. Proper sorting /checking using trained man power. Proper labeling of source code,	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
				grade.		
Additives inspection	**Biological** Bacterial pathogen	No	Likelihood-L Severity -H	In salt clostridium bacteria may be chance. Lot wise analysis of clostridium bacteria by external lab.	…….	NO
	Chemical Food grade	No	Likelihood-L Severity -H	Salt & carnal might have health hazards chemicals. MSDS /food grade certificate from manufacturer/ suppliers.	……..	No
Washing/Draining/Final count & sorting	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food handler's personnel hygiene & food contact surface. All food handlers should be checked personnel hygiene and the same recorded. Food contact surface sanitized as written procedure.	……..	No
	Chemical Nil	No	…….	No chemical contamination at this step.	……	No
	Physical Nil	No	.....	From food contact surface, from food handlers. crates & nets are made by as per policy monitoring & verification (broken & damaged in place and also to avoid metal fragment table to make by SS. To avoid unsecure jewelry all food handler is checked before enter the processing area and recorded the same.	……..	No
	Quality Organoleptic	No	Likelihood –L Severity-L	More defective pieces may be going to on slab. Trained /skilled employees are provided to check the defective pieces. Randomly checking of pre freezing inspection & same to be recorded.	…….	No But this step considers as CQP

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
Arranging in IQF feeder	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food contact surface of trays, nets etc. From Personnel hygiene of food handlers. Proper cleaning & sanitization of trays & nets. Periodical hand sanitation.	……	No
	Chemical Nil	No	……	No source of chemical contamination.	…….	No
	Physical Nil	No	……	No source of physical contamination.	……..	No
	Quality Nil	No	……	Improper arrangement may affect customer satisfaction. Individual quick frozen to avoid clumping of pieces.	…….	No
Freezing	**Biological** Nil	No	…….	No biological contamination in this step -40^{0}Cfreezing activity in place.	……	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	…….	No source of physical contamination.	…….	No
	Quality Improper freezing	No	Likelihood-L Severity-H	Time & temperature fluctuation of IQF freezer may lead in to improper freezing. Controlled, monitor time & temperature of IQF freezer.	…….	No But this step considers as CQP
Glazing	**Biological** Bacterial pathogen	Yes	Likelihood-L Severity-L	Addition of microbes thorough impure water. Controlled by SSOP, regular cleaning of chilling tanks and spray nozzles. in house bacteriological report.	…….	No
	Chemical	No	…….	No source of chemical	……	No

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(Managing Director)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Nil			contamination.		
	Physical Nil	No	……	No source of physical contamination.	…….	No
	Quality Nil	No	…….	Due to over defrosting glaze will affect. Ensure the uniform spray of water, controlled by SOP.	…….	No But this step considers as CQP
Glaze Hardening	**Biological** Nil	No	……	No source of microbial contamination. -40^{0}C hardening in place.	…….	No
	Chemical Nil	No	……	No source of chemical contamination.	……	No
	Physical Nil	No	……..	No source of physical contamination.	……..	No
	Quality Nil	No	……..	…….	……	No
Packing material inspection	**Biological** Nil	No	…….	Internal bacteriological report.	……	No
	Chemical Toxic printing ink	Yes	Likelihood-L Severity- M	Toxic printing ink may cause health hazard	No toxic printing ink used in printing & food grade materials are used.	No
	Physical Damage	No	Likelihood-L Severity-M	Damage packing materials from suppliers. External quality report for packing material. Declaration from manufacturer/Supplier.	……..	No
	Quality Quality of packing material	No	Likelihood-L Severity-M	Poor quality of packing material may affect the customer satisfaction. External quality report for packing material. Declaration from manufacturer /supplier.	……	No
Pouching/	**Biological**	Yes	Likelihood-L	Packing supplier poor handling their	……..	No

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(Managing Director)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Weighing	Bacterial pathogen		Severity-L	facility may chance microbial contamination.		
	Chemical Nil	No	……	No source of chemical contamination at this Sep.	……..	No
	Physical Nil	No	……	No source of physical contamination at this step.	…….	No
	Quality pouch sealing	Yes	Likelihood-L Severity -M	Improper sealing of pouches may affect customer satisfaction. Use only very good condition sealer & also check the status of the sealing. Confirmed to customer specification.	Controlled by GMP.	No
Metal detection	**Biological** Nil	No	…….	No source of microbial contamination at this step.	……..	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Metal fragment	Yes	Likelihood-L Severity-H	Metal fragment may contaminate the product. It is hazard to health.	Continuously all pouches pass through metal detector & record. Metal detector also calibrated.	Yes CCP-2
	Quality Nil	No	……	……	…….	No
Packing /labeling	**Biological** (Allergens) Shrimps	No	Likelihood-H Severity-H	Crustaceans are one of the major allergen that may allergic to some consumer.	Shrimps (Crustacean) are allergic to some consumer.	Yes CCP-3
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Damage	No	Likelihood-L Severity -M	Damage packing materials from suppliers. External quality report for packing material. Declaration from manufacturer/Supplier.	……	No
	Quality Quality of packing	No	Likelihood-L	Poor quality of packing material may affect the customer satisfaction.	……	No

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(Managing Director)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	material		Severity-M	External quality report for packing material. Declaration from manufacturer /supplier.		
Cold storage	**Biological** Nil	No	…….	Not likely to occur because of cold storage are designed & maintained. Time & temperature monitoring and recording physical verification.	……	No
	Chemical Nil	No	……..	No source of chemical contamination.	…….	No
	Physical Temperature	No	Likelihood-H Severity-H	Temperature fluctuation from cold storage may affect the product quality. Cold storage temperature is maintained -18^{0}C.automatic temperature monitoring device connected with computer.	……	No
	Quality Appearance	No	Likelihood-H Severity-H	Improper maintenance of cold stores may affect the quality of the products. Cold storage is properly maintained. FIFO system is followed.	No	…….
Shipment	**Biological** Nil	No	…….	Final product covered with protected polythene/ inner carton/ master carton and closed with self-adhesive tape.	…….	No
	Chemical Nil	No	……..	No chemical contamination in this step.	……	No
	Physical Nil	No	……	Not likely occur because frozen storage is maintained at -18^0 c temperature.	……	Nil
	Quality Temperature abuse and	No	Likelihood-L Severity-L	Improper handling, temperature abuse and carton quality design, product may affect the customer	……	No But this step

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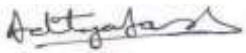

(Managing Director)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Improper handling			satisfaction. Monitoring of incoming cartons, loading operation & temperature recording.		considers as CQP.

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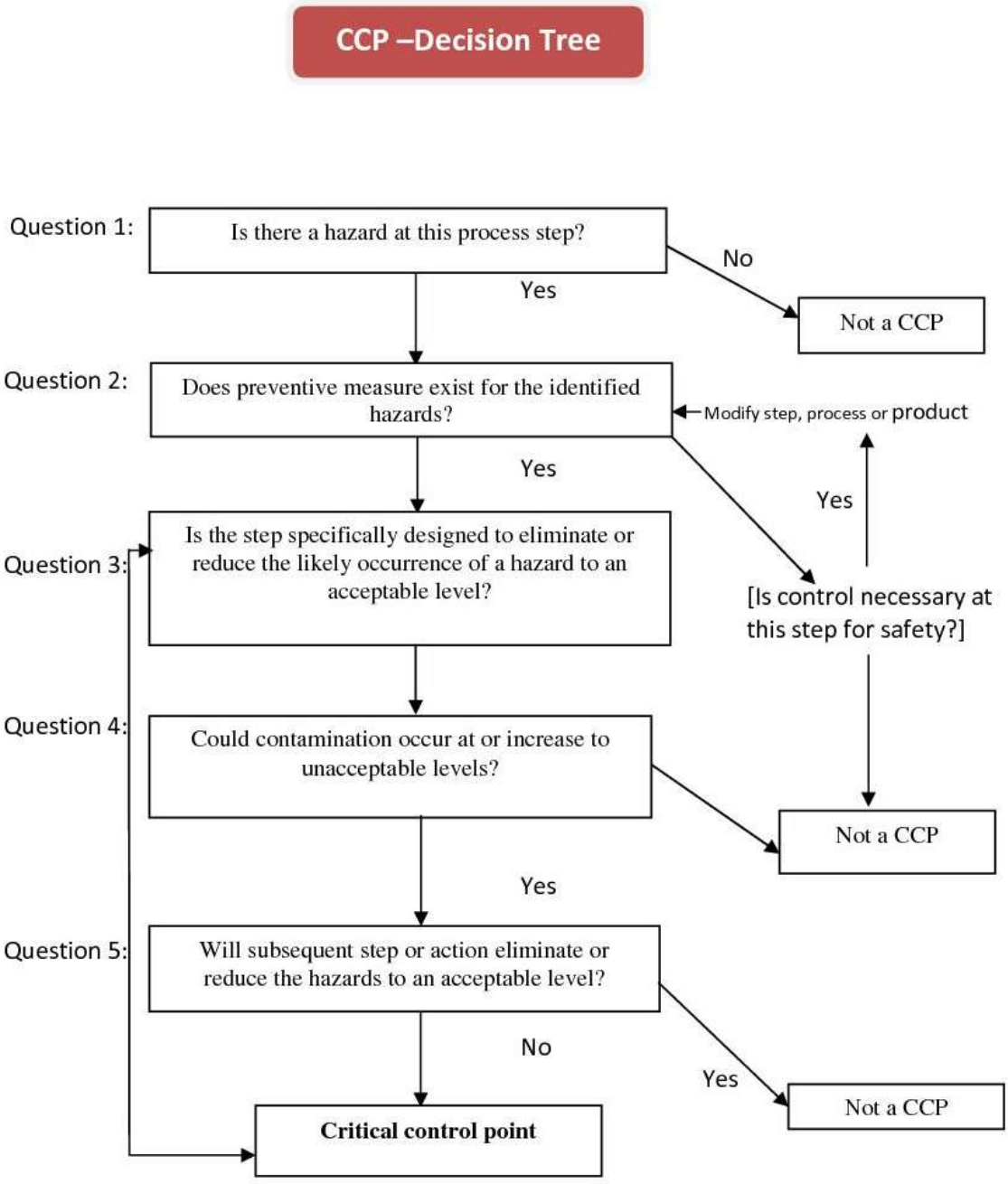
VI. CCP - Decision Tree



VII. CCP - Decision Tree Analysis

The decision tree is applied to all steps of hazard analysis worksheet and not limited to CCP alone.
Following is CCP determination for IQF raw frozen aqua-culture shrimps:

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Raw material receiving	**Biological** -pathogen **Chemical** - **Chemical** -Antibiotic(Annex-5 table –II of BAP Manual) -pesticides -Sulphite -Herbicides **Physical** -Glass -wood -stone -plastic **Quality** -Black spot	Y Y Y Y	Y Y Y Y	Y Y N N	… … Y Y	… … Y Y	CCP CCP Not a CCP Not a CCP	Survival of pathogenic bacteria from harvesting area at farm. Farm shrimps may have sulphite, pesticides, herbicides & antibiotic residues. Residues of the aquaculture drugs listed in Annex 5, Table II as appropriate for the species It may cause illness to the consumer. Sulphite agents may cause allergic type reaction. There is no further step to control the hazard. …….
Deicing/washing	**Biological** -Pathogen **Chemical** Nil	Y …	Y ….	N ….	Y ….	Y …..	Not a CCP …..	…….. ……..

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
	Physical Nil **Quality** Nil	…. ….	…… ….	…. ….	… ….	…. …..	…… ….	…… …….
Deheading	**Biological** Pathogen **Chemical** Nil **Physical** Nil **Quality** Nil	Y …. …. ….	Y …. …. ….	N …. ….. ….	Y ….. …. ….	Y …. ….. ….	Not a CCP …. ….. ……	……. ……. …….. ……..
Grading	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y …. …. 	Y …. …. Y	N …. ….. N	Y …. ….. Y	Y …. ….. Y	Not a CCP ….. ….. …..	…… ……. …… …….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Peeling	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	 Y …. …. Y	 Y …. …. Y	 N …. ….. N	 Y …. ….. Y	 Y …. ….. Y	Not a CCP ….. ….. Not a CCP	….. ……. …… …….
Washing	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Nil	 Y …. …. ….	 Y …. …. …	 N …. ….. ….	 Y …. ….. ….	 Y …. ….. …..	Not a CCP ….. ….. …..	…… ……. …… …….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Additives inspection	**Biological** Pathogens **Chemical** -phosphate -salt **Physical** Nil **Quality** Nil	 Y Y …. ….	 Y Y …. ….	 N N ….. …..	 Y Y ….. ….	 Y Y ….. …..	Not a CCP Not a CCP ….. …..	….. ……. …… …….

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(Managing Director)

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Treatment	**Biological** Pathogens **Chemical** -phosphate **Physical** Nil **Quality** Organoleptic	 Y Y …. Y	 Y Y …. Y	 N N ….. N	 Y Y ….. Y	 Y Y ….. Y	Not a CCP Not a CCP ….. CQP	….. ……. …… Excess residue of phosphate may lead to no acceptance.
Final checking/weighing	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y … …. Y	Y …. …. Y	N … ….. N	Y …. ….. Y	Y …. ….. Y	Not a CCP …. ….. CQP	….. ……. …… Defective pieces may be fed in to IQF freezer.

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(Managing Director)

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Feeding	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	 Y …. …. Y	 Y …. …. Y	 N …. ….. Y	 Y …. ….. N	 Y …. ….. Y	 Not a CCP ….. ….. …..	 …… ……. …… …….

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('Managing Director)

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
IQF freezing	**Biological** Nil **Chemical** Nil **Physical** Nil **Quality** Improper freezing	…. …. …. Y	….. …. …. Y	….. …. ….. Y	…. …. ….. N	…. …. ….. N	….. ….. ….. CQP	…… ……. …… Improper /insufficient glaze may affect buyer's acceptance & shelf life.
Hardening	**Biological** Nil **Chemical** Nil **Physical** Nil **Quality** Nil	….. … …. ….	….. …. …. …..	…… … ….. …..	….. …. ….. …..	….. …. ….. ……	…. …. ….. …..	….. ……. …… ……..

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(Managing Director)

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Weighing / Pouching	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality packing	Y	Y	Y	N	N	CQP.	Packing may affect customer acceptance and reputation.
Metal detector	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Metal fragment	Y	Y	Y	N	N	CCP-2	Metal fragments may come into product.
	Quality Nil	….	….	….	…	….	……	…….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Packing material inspection	**Biological** (Allergens)	Y	Y	Y	Y	Y	CCP-3	Crustaceans are one of the major allergen that may allergic to some consumer.
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Quality of packing material	Y	Y	N	Y	Y	Not a CCP	…….
packing	**Biological** Pathogens	Y	Y	N	Y	Y	CCP-3	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Improper labeling	Y	Y	Y	N	N	CQP	Improper labeling will lead to wrong identification of product.
Cold storage	**Biological** Nil	….	….	…..	…..	….	……	…..

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Nil	….	….	….	….	…	…..	……..
Shipment	**Biological** Nil	….	….	…..	…..	….	……	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Damage carton	Y	Y	Y	N	N	CQP	Improper labeling, temperature abuse & carton quality may damage product.

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VIII. Justification of CCP - IQF Freezing (Aquaculture)

Process step	CCP	Justification	
CCP-1 Raw material Receiving	Growth of microbial pathogen.	Temperature of the material should be <4^{0}C	USFDA Regulation and Codex Alimentarius guidelines 5.3(CAS.RCP 1-1969, Rev. 4-2003) & as per BAP standard Annex5, Table -II Detection Limit: Chloramphenicol: 0.3ppb Nitrofuran :1.0ppb Sulphonamide :No residue permitted Oxy tetracycline :No residue permitted Tetracycline : :No residue permitted Malachite green :No residue permitted Lueco malachite green :No residue permitted Quinolones : :No residue permitted Flouroquinolones :No residue permitted
	Antibiotics	**Maximum permissible limit** Chloramphenicol - Nil Nitrofuran -Nil Oxytetracycline -Absent Sulphonamide -Absent Malachite Green - ND Leuco Malachit Green – ND Quinolones – ND Oxy tetracycline – ND Tetracyline –ND Flouroquinolones –ND	
	Pesticides	**Maximum permissible limit** BHC, Aldrin, Dieldrin 0.3 ppb DDT 5.0ppm	
	Sulphite	Maximum permissible limit is – Nil	
	Herbicides	Maximum permissible limit is – Nil	
CCP-2 Metal Detector	Metal fragment	Ferrous :1.5mm Nonferrous :2.0mm Stainless Steel: 2.0mm	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003)

CCP-3 Labeling/ Packing	***Clostridium botulinum*** toxin formation during storage Shrimps(Crustaceans)	***C. botulinum*** toxic formation during finished product storage which leads to symptoms like weakness, vertigo, swallowing and frequently abdominal swelling, consumption, paralysis & death Crustaceans are one of the major allergen that may allergic to some consumer..	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)

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IX. Justification IQF Freezing Aquaculture (Critical Limit)

PROCESS STEP	CCP	CRITICAL LIMIT	REFERENCE
CCP-1 Raw material Receiving	Growth of microbial pathogen.	Temperature of the material should be <4^{0}C	USFDA Regulation and Codex Alimentarius guidelines 5.3(CAS.RCP 1-1969, Rev. 4-2003) & as per BAP standard Annex5, Table -II Detection Limit: Chloramphenicol: 0.3ppb Nitrofuran :1.0ppb Sulphonamide :No residue permitted Oxy tetracycline :No residue permitted Tetracycline : :No residue permitted Malachite green :No residue permitted Lueco malachite green :No residue permitted Quinolones : :No residue permitted Flouroquinolones :No residue permitted
	Antibiotics	**Maximum permissible limit** Chloramphenicol - Nil Nitrofuran -Nil Oxytetracycline -Absent Sulphonamide -Absent Chloramphenicol - Nil Nitrofuran -Nil Oxytetracycline -Absent Sulphonamide -Absent Malachite Green - ND Leuco Malachit Green – ND Quinolones – ND Oxy tetracycline – ND Tetracyline –ND Flouroquinolones –ND	
	Pesticides	**Maximum permissible limit** BHC, Aldrin, Dieldrin 0.3 ppb DDT 5.0ppm	
	Sulphite	Maximum permissible limit is – Nil	
	Herbicides	Maximum permissible limit is – Nil	
CCP-2 Metal Detector	Metal fragment	Ferrous : 1.5mm Non ferrous : 2.0mm Stainless Steel : 2.0mm	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003)
CCP-3 Labeling/Packing	***Clostridium botulinum*** toxin formation during storage	***C. botulinum*** toxic formation during finished product storage which leads to symptoms like weakness, vertigo, swallowing and frequently abdominal swelling, consumption, paralysis & death.	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)
	Shrimps (Crustaceans)	Crustaceans are one of the major allergen that may allergic to some consumer.	USFDA Food Allergen Labeling and Consumer Protection Act of 2004 (Public Law 108-282, Title II)

X. Justification of CQP IQF Freezing

PROCESS STEP	**HAZARDS**	**CRITICAL LIMIT**	**JUSTIFICATION**
CQP-1 Chemical treatment	Residual phosphate in excess of the critical limit.	5000ppm	Agreement with buyers.
CQP-2 Final checking	Organoleptically defective pieces.	As per finished product specification.	Agreement with buyers
CQP-3 Freezing	Improper freezing.	Core temperature of product must be not less than -18^{0}C	In-house /industry specification.

CQP-4 Glazing	Improper of insufficient glaze.	As per buyer's specification.	Agreement with buyers
CQP-5 Weighing/packing	Short weight, wrong labeling/ packing	As per buyer's specification.	Agreement with buyers
CQP-6 Shipment	Core temperature of product while loading. Master carton quality while loading.	Must not be less than -18^{0}C. Damaged /quality compromised cartons.	In-house/industry/Buyer's specification.

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(Managing Director)

XI. HACCP (CCP) Plan Form for Aquaculture Shrimps (IQF)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

Approval No.**370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **IQF FROZEN**
(H/ON, H/L, PD, PUD, PDTO, EZPEEL) AQUACULTURED SHRIMP

Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		
CCP-1 Raw material head on receiving stage	<u>Antibiotics</u> Chloramphenicol Nitrofuran & Nitrofuran metabolites (AOZ, AMOZ, AHD, SEM) Tetra cycline Oxytetracycline Sulphonamides Malachite Green Lueco Malachite green Quinololones Flouro quinolones.	Absent	Presence of antibiotics.	Pre harvesting test certificates from competent Lab. (for EU countries). In–house ELISA test done for the receiving raw material (for non EU countires) Ensure supplier declaration certificate. Antibiotic testing of material through internal lab & once in two months from external competent lab.	Every lot received and each consignment wise and code wise. Each supplier provides declaration at the time of delivery of material. External testing once in two	Q.C Technologist	Reject lot if not accompanied by certificate. Stop all purchases from supplier if tests are positive. Remove the supplier from approved supplier list if it is positive, action will be taken against supplier. If it is positive,	Antibiotic test reports. Supplier declaration .	1.Verification of monitoring records within 7 days by Q.A manager. 2. Raw material analysis report. (testing in an EIC approved lab once in two months for antibiotics. 3.Consignment wise checking of antibiotic in finished product in an EIC approved lab. 4. Supplier guarantee letter. 5. ELISA antibiotic testing.

1	2	3	4					5	6
	<u>Pesticides & Herbicides</u> BHC, ENDRIN DEILDRIN, ALDRIN, DDT, PENDIMETHALIN <u>Sulphite</u>	Absent Absent	Presence of pesticides Residue of sulphite content.	Declaration from supplier for non-usage of pesticides and other banned chemical. Do the sulphite analysis test.	months to cover all suppliers. Daily source of raw material testing. Each lot of raw material received.	Q.C Technologist Q .C Technologist	action will be taken against suppliers. Remove the supplier from approved list.	External test report for pesticides once in a two month Sulphite test record.	Review the external lab reports done once in two months BHC, Endrin, Dieldrin, Aldrin :10 ppb DDT :10ppb Pendimethiline :10 pbb Review sulphite analysis test report.
	<u>Biological</u> Growth of microbial pathogen	Temperature of raw material should be $<4^0$C	Temperature of raw material	By thermometer	Each lot of raw material received	Q .C Technologist	Reject the lot if raw material temperature is $>4^0$C	Raw material receiving register Bacteriological register. Thermometer calibration record	Review of the: Raw material temperature records. Bacteriological register Thermometer calibration record.
CCP-2	Metal fragment	Fe	Metal	Each pouch passing	Continuously	Packing	The detected	Metal detector	CCP-2 verification of

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(Managing Director)

1	2	3	4					5	6
Metal detection		:1.5mm Non Fe: 2.0mm SS: 2.0mm	fragments	through metal detector		supervisor	pouches are removed and put in a locked box. The production manager /general manager unlock the box and defrost the pouch. Divided in to 4 parts. Pass each individual piece through metal detector. If any individual detected, take the pieces cut with knife and analysis metal fragment. Then take out defected pieces. Before passed pouch also take & recheck /pass through metal detector.	records.	metal detection Before starting the process pre operation checking has done with standard test pad then also periodically verification carried out every 30 minutes. Verification done once in a week.
CCP-3 (packing/Labeling)	Shrimps, (Crustaceans)	All finished product labeled with "containing	Finished product labeling statement "contains	By visual	Label on each carton	Supervisor/ QA/ QC / Production In-charge/ Package	Segregation of the lot at re-labeling	Label approval record	Review in once in a week

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1	2	3	4					5	6
	botulinum toxin formation during finished product storage.	shrimps" All finished product labeled with "Keep Frozen at below -18^{0}C"	Shrimp" "Keep Frozen at or below -18^{0}C"			executive/ Managing Director			

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(Managing Director)

XII. HACCP (CQP) Plan Form for Aquaculture Shrimps (IQF)

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		
CQP-1 Chemical treatment	Phosphate residue	Max. 5000 ppm	Phosphate residue testing.	Chemical analysis through strip method.	Daily source wise.	Q.C Technologist	If phosphate exceeds limit label on the master carton level of ppm	Soaking monitoring records.	Phosphate residual reports are verified by Q.A manager.
CQP-2 Final checking	Organoleptic	20%	Checking of defective pieces.	By online checking.	continuously	Q.C Technologist	Continuous training to improve skill.	pre-freezing inspection record (IQF)	Daily verification of pre freezing inspection record.
CQP-3 Freezing	Improper freezing	Min -18^{0}C	Temperature monitoring of frozen products.	Check freezing time and core temperature of product.	continuously	Production supervisor.	Segregate improperly frozen product & re-freeze.	Monitoring record for freezing IQF.	Daily verification of freezing monitoring record.
CQP-4 Glazing	Improper glaze	As per customer specification	Temperature of glaze water. On choke the nozzles, belt speed.	Controlling of time, temp., belt speed & cleaning of nozzles.	continuously	Production supervisor. Q.C Technologist	If glaze is less than required send product for re glazing.	Freezing monitoring and process control. (IQF line)	Daily verification of freezing monitoring & process control records.
CQP-5 Weighing/ packing /labeling	Wrong labeling & packing	Nil	Labeling & packing operation.	by visual check of packing process	continuously	Production & packing supervisor	Check for any mislabeling, printing and correct it.	IQF packing record.	Daily verification of packing record.
CQP-6 Shipment	Temperature	-18^{0}C	Monitor loading temperature	Check temperature of container & cargo.	Every shipment	Cold store supervisor / Q.C technologist	Stop loading until the temperature is achieved.	Shipment details record.	Q.A to verify shipment detail record for each shipment.

XIII. Predetermined Corrective /Preventive Action

A. When Antibiotic/Sulphite Residue (CCP-1) Exceed Critical Limit

a) Immediate corrective action:

Identify affected lots through, source code and withdraw day code and withdraw all such lots from the processing floor as well as cold stores.

Tally the total withdrawn lots for quantity.

b) Preventive action:

The supplier is traced back from the source –code and /or day code and removed from approved suppliers list to get rid of unworthy business alliance (his supplier declaration proves his untrustworthiness)

c) Corrective action records:

CCP verification & corrective action reports for Antibiotic and sulphites.

B. When Metal Detection Exceed (CCP-2) Critical Limits

a) ***Immediate corrective action:***

The detected pouches /slabs are keeping as non-conformance in de marked cold store area.

b) ***Preventive action:***

The entire process line is traced and checked thoroughly for any possibility of loose metal, rust scrap etc. and any such situation upon notice is corrected.

c) ***Corrective action records:***

An NCR is raised and corrective action with regard to the same is reported back using the CCP verification and corrective action format for metal detector.

C. When Packing Material & Labeling (CCP-3) Critical Limits

a) Immediate corrective action:

Segregate and return or destroy any label stock or pre- labels packing stock that does not contain the proper statement. Determine and correct the cause of improper labels.

b) Preventive action:

i. Finished products label for the presence of a “keep frozen” & “contains shrimps” statement.

ii. Visual examination.

iii. Representative number of package from each lot products.

iv. Any person who has an understanding of the natural of controls.

c) Preventive action:

Record of labeling checks.

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(Managing Director)

15. Fresh Frozen Raw Sea caught/Wild Caught Shrimps (Block Freezing)

I. Product Description of Raw Block Frozen Sea-caught/Wild-caught Shrimps

Source of Raw Material	Fresh raw material purchased from approved suppliers (Sea catch /Wild Catch material)
Product	Fresh block frozen raw shrimps
Varieties	Head on – shrimps (H/on)
	Headless Shell-on Shrimps (HL, EZ PEEL)
	Peeled Deveined Tail-on (PDTO, Round cut)
	Peeled Deveined Tail-on (BUTTERFLY 70% Cut)
	Peeled Undeveined Tail-off (PUD, Round cut)
Packing	6 x 1.816Kg, 10x2Kg, 6x1.2Kg,6x1Kg, 10x4lbs etc., (Type of pack and Pouch / M/c as per buyer's requirements)
Storage conditions	-18 Degree centigrade
Shelf life of the product	24 months from the production date or as per the specification of Importing countries.
Method of Preservation	Contact Plate Freezer (Block freezing)
Additives used	Salt and Sodium-Tri-Poly-Phosphate(STTP) as per buyer's requirement
Distribution	To all countries by refrigerated carriers (including E.U Countries, Russian Federation & Australia) If we exported uncooked prawns to Australia, each batch tested on arrival in Australia and found to be free of WSSV and YHV. When we export the products for Russian Federation the sample is free from manmade radionuclide contamination. Sample is fit for human consumption from radiological point of view.

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Intended use by customer	To be consumed by general public**(Crustaceans) contain Allergens** When thawing, we recommend ….. Place Bag of shrimps overnight into the refrigerator or empty desire amount into a container of cool water for approximately 5 minutes' drain. It's now ready for cooking. Re-freezing thawed product is not recommended.

II. Production Flow Chart for Fresh Frozen Raw Sea Caught /Wild Caught Shrimps (Block Frozen)

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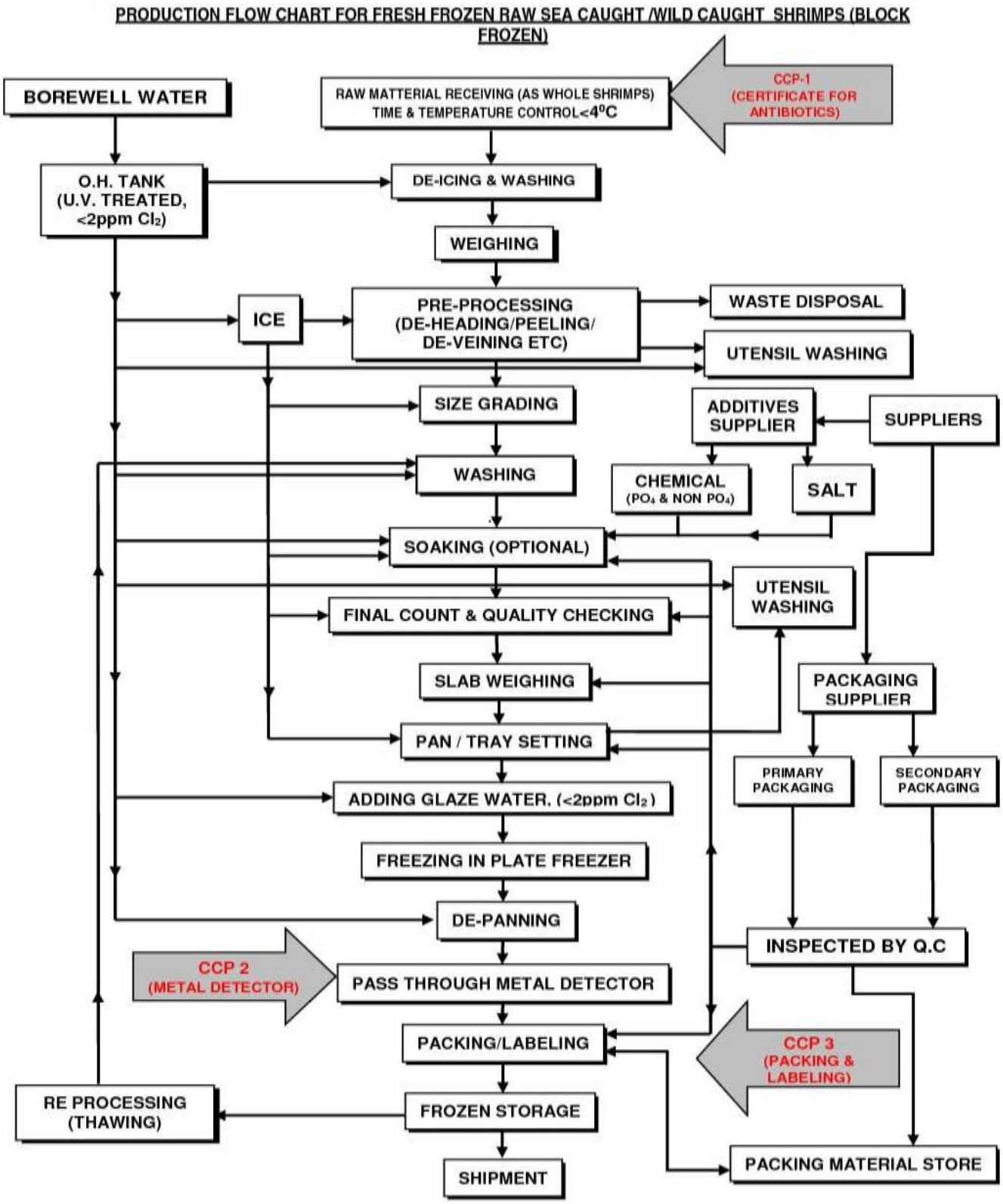

III. Processing Steps of Fresh Frozen Raw Shrimps (Process Description)

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❒ The heads alone of the prawns are removed, leaving the entire shells and tails intact;

❒ The vein (intestine) is pulled out as far as possible from the severed head portion; hanging meat along with the red membrane is removed.

❒ Washed well after de-heading;

❒ Discolored, bruised and soft-shelled pieces at the grading time are discarded.

❒ After grading, the HL/PUD/PD/PDTO are packed in doubly waxed duplex board cartons of 1.8 Kgs/ pan of 2 Kgs made of stainless steel (or as per buyers' requirement) each with declared size, grade.

❒ For peeled shrimps the shell is completely removed and either or vein is removed by sharp knife. Dehydrated & discolored smelling pieces are segregated and rejected.

❒ Peeled material is thoroughly washed in perforated tub and re-iced properly.

❒ Graded materials are packed in duplex cartons with top layered arranged up to 80/120 and jumble pack for 100/200 to broken.

❒ Packing is in a parallel style with uniform arrangement, no cross packing.

❒ Add ice cold glaze water (2 ppm chlorine);

❒ In HL type of product, the flavor and nutrients is maximum due to the protection offered by the shell.

IV. On Site Verification of Process Flow for Block Frozen Sea Caught/ Wild Caught Shrimps

Whole shrimps are received at the receiving room through landing platform of Pre-Processing section. Each batch of raw materials are properly deiced and check temperature <4^{0}Cand washed with potable water. Materials supplied by different suppliers are tagged with labels with detailed information. Materials of a particular variety are accepted at a time after satisfying the raw material acceptance criteria (Appendix-III) and rejected the materials which are not satisfied the acceptance criteria. Rejected materials are taken in crates with tag rejected and handed over to the agent/supplier after the batch is over. Purchase supervisor accepts the materials based on accepting criteria and records his observation in the raw material receiving log (Annexure-I). After proper washing with chlorinated water of < 2 ppm. strength and weighing, the head on materials are adequately iced in sanitized crates and kept in the chilled room of pre-processing section, maintained the temperature below +4^{0}Cor sent to the preprocessing section directly, if no more balance material is there. This operation is completed within minimum time. A time temperature log for the chill room is maintained by the supervisor to keep a check on temperature abuse. At the time of de-heading or peeling etc., adequate and experienced workers are engaged to ensure quick completion of the activity. During the operation, adequate flake ice is used to maintain the temperature below +4^{0}C. The headless or peeled materials are further washed with Chlorinated water of <2 ppm. Strength and adequately iced in sanitized crates. Raw material samples drawn for microbiological/ antibiotic test as per the schedule.

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After receiving in the processing section, prior to grading each crate of material is de-iced and washed with chlorinated potable water. To minimize the cumulative exposure of material to high temperature, delay during manual grading is avoided. The graded materials are adequately iced and kept in plastic crates. To avoid time temperature abuse, excess materials are stored in the chill room or insulated boxes in the processing section with adequate ice. For time temperature log of chill room maintained to keep a check of temperature abuse.

The graded headless materials are deiced and taken for wash to remove the filth. In case of peeled materials, after deicing the materials are fed into the automatic grading cum filth washing machine to remove the filth. Prior to final weighing of the slabs each individual grade of single variety is washed with chlorinated water <2 ppm. Strength and taken on perforated table to drain out the excess water. At this stage the code slip in addition to the mandatory information also incorporated.

Before weighment, the materials are taken for final grade checking and colour segregation. Following weighment, slabs are taken to a setting table to arrange the materials in pan/inner cartons. Technologists inspect the processed slabs to check the count, weight and other quality parameters and record the observation in the register of processing (Annexure-III)

After packing chilled glaze water with < 2 ppm. Chlorine label is poured into the slabs. These slabs then taken to pre-cooled plate freezer for freezing. The slabs are frozen at - 40^{o}C in 90 minutes. A logbook for plate freezer is maintained by the production supervisor to ensure the proper freezing of the materials (Annexure-XV).

Upon unloading, slabs are taken to the anteroom for final packing. Hardness of slabs are checked. Ante room temperature is always maintained. Properly dressed store boys are allowed to handle the finished products. In case of pan freezing, slabs are taken out with de-panning machine and packed in laminated inner carton. All slabs are put into master carton bearing describe packing, declaration for particular varieties as per requirements.

Following the days' production, the product is tested code wise, type wise of Organoleptic and Bacteriological examination by approved technologist (Lab). The same are recorded (Annexure-XVIII, XIX, XX, XXI, XXII,). A particular lot is approved for shipment if the lot satisfies the quality criteria of the competent authority and that of the importing country.

Besides as per our practice samples are drawn randomly for test of antibiotic residue to a level of .01 ppb by HPLC-LCMSMS Method particularly for chloramphenicol and Nitrofuran groups in EIC approved Laboratory. Records are maintained by technologists. For any type of products, materials are accepted on supplier's guarantee. Pesticides, antibiotics drug and heavy metals (Hg, As, Cd, Pb, Ni, Cr & Sn) salts and STPP are tested as follows:

Antibiotics, Heavy Metals and Pesticides residue is tested at EIC approved LAB for raw material once in two months and covering different sources/suppliers on rotation basis and also finished products testing is done consignment-wise before each shipment.

SALT-Salt is tested for staphylococcus and sulphite reducing clostridium once in six months if same batch is continued otherwise tested every batch at EIC approved laboratories.

STPP-The permissible percentage of phosphate in finished products are tested once in six months by EIC approved laboratory. Antibiotics, Heavy Metals and Pesticides are sent to EIA / SEA LAB for residue analysis as specified by the local EIA for which the sample is drawn by EIA.

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(Managing Director)

V. Hazard Analysis Worksheet for Fresh Frozen Raw Shrimps (Block Frozen)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

Approval No.**370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **BLOCK FROZEN**
(H/ON, H/L, PD, PUD, PDTO, EZPEEL) SEA CAUGHT/ WILD CAUGHT SHRIMP

Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
INGREDIENTS/PROCESSING STEP	**IDENTITY POTENTIAL HAZARDS INTRODUCED/ CONTROLLED OR ENHANCED AT THIS STEP**	**ARE ANY POTENTIAL FOOD SAFETY HAZADOUS SIGNIFICANT? (YES/NO)**	**INDICATE LIKELIHOOD & SEVERITY OF HAZARD, HIGH-H; MEDIUM-M; LOW-L**	**JUSTIFY YOUR FOOD SAFETY HAZARDS FOR COLUMN 3**	**WHAT CONTROL CRITICAL DECISION MEASURES CAN BE APPLIED FOR THE SIGNIFICANT HAZARDS**	**IS THIS STEP CCP/CQP (YES/NO**
Receiving whole shrimps at raw material receiving section	Biological Bacterial pathogen growth	Yes	Likelihood-H Severity-H	Raw materials are always having high load of pathogen	Proper time temperature control Raw materials temp <4^{0}Cif more reject the lot. ➢ GMP ➢ SSOP ➢ SOP at processing plant.	Yes CCP-1
	<u>Chemical</u> ➢ Antibiotic residue ➢ Pesticide ➢ sulphite	Yes	Likelihood-H Severity-H	Antibiotic residue/pesticide residue/sulphite residue are toxic & potential allergen and that may cause cancer.	(1) Pre-harvesting certificate from MPEDA authorize Lab. For antibiotics test report by ELISA kit. Once in two-month interval for pesticides and Heavy metals. (2) Supplier Declaration	Yes CCP-1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Metal fragment, stone, plastic, wood & objection able foreign materials	No	Likelihood- L Severity-H	All sorts of physical contamination are possible & cause injuries to consumer acceptance.	……	No
	Quality Organoleptic	No	Likelihood-M Severity -L	Affects finished products quality due to improper handling, lack of improper icing, improper storage in crates	…….	No
Deicing, washing, Weighing	Biological Bacterial pathogen growth	No	Likelihood-M Severity -H	From food contact surfaces, workers handling, time delay, temperature fluctuation. proper layer icing, maintained temperature below 4^0C	……	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Nil	No	…….	No physical contamination at this step	……	No
	Quality organoleptic	No	Likelihood – L Severity - L	Maintain raw material temperature below 4^0C	……..	No
Re-icing	**Biological** Bacterial pathogen	No	Likelihood-L Severity -L	Proper time temperature control (SSOP) Food contact surfaces Contaminate ice may cause pathogen growth.	……	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Foreign material	No	Likelihood-L Severity -H	From food contact surface like broken plastic & metal pieces etc.	…….	No
	Quality Temperature	No	Likelihood-L Severity -M	From temperature abuse of the raw material may affect the quality.	…….	No
Deheading /peeling/deveining/filth washing etc.	**Biological** Bacterial pathogen	No	Likelihood-M Severity-H	From food contact surface, time temperature control, proper layer icing & using chill water.	…….	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	…….	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No
	Quality Organoleptic	No	Likelihood-L Severity-L	Hanging meat / red meat may affect consumer acceptance. proper trimming of red meat, SOP if Deheading procedure	…….	No
Deicing & size grading	**Biological** Bacterial pathogen	No	Likelihood – L Severity -H	From food contact surface & personnel hygiene, proper time /temperature control. Proper icing of grading materials.	…….	No
	Chemical Nil	No	…….	No source chemical contamination.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Nil	No	…….	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No
	Quality Organoleptic	No	Likelihood-L Severity -M	Wrong grading, defective/wrong pieces may exceed the specification, /uniformity ratio. Proper sorting /checking using trained man power. Proper labeling of source code.	…….	No
Additives inspection	**Biological** Bacterial pathogen	No	Likelihood-L Severity -H	In salt clostridium bacteria may be chance. Lot wise analysis of clostridium bacteria by external lab.	…….	NO
	Chemical Food grade	No	Likelihood-L Severity -H	Salt & carnal might have health hazards chemicals. MSDS /food grade certificate from manufacturer/ suppliers.	……..	No
	Physical Pest infestation	No	Likelihood-L Severity -H	From pest infestation & other physical character may affect quality of the products.	……	No
	Quality Free flow, moisture, appearance	No	Likelihood – L Severity -H	Quality of salt, carnal additives is inspected as per sampling plan & recorded.	…….	No
Treatment	**Biological** Bacterial pathogen	No	Likelihood-L Severity-H	May contaminated water causes pathogen growth. Proper schedule & monitoring of hygiene & sanitation activity, time /temperature control.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chemical Salt, carnal	No	Likelihood-L Severity- H	Excess salt & phosphate residue may lead to buyer non-acceptance. Use of quantified chemicals, adherence to treatment specs and issue register & also additional checking to be done.	…….	No
	Physical Nil	No	…….	No source of physical contamination	…….	No
	Quality organoleptic	No	Likelihood-L Severity-H	Treatment may generate defective pieces. Gentle agitation through agitator & trained employees involved in this process. Excessive use of chemical will lead to bitter test and loss of texture.	…….	No But this step considers as CQP.
Washing/Draining/Final count & sorting	**Biological** Bacterial pathogen	No	Likelihood-H Severity-H	From food handler's personnel hygiene & food contact surface. All food handlers should be checked personnel hygiene and the same recorded. Food contact surface sanitized as written procedure.	…….	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Nil	No	.....	From food contact surface, from food handlers. crates & nets are made by as per policy monitoring & verification (broken & damaged in place and also to avoid metal fragment table to make by SS. To avoid unsecure jewelry all food handler is checked before enter the processing area and recorded the same.	……..	No
	Quality Organoleptic	No	Likelihood – L Severity-L	More defective pieces may be going to on slab. Trained /skilled employees are provided to check the defective pieces. Randomly checking of pre freezing inspection & same to be recorded.	…….	No But this step considers as CQP
Weighing /pan setting and glazing	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food contact surface of pan, lids etc. From Personnel hygiene of food handlers. Proper cleaning & sanitization of pan lids & polythene cover. Periodical hand sanitation.	…….	No
	Chemical Nil	No	……	No source of chemical contamination.	…….	No
	Physical Nil	No	……	No source of physical contamination.	…….	No
	Quality Organoleptic	No	Likelihood – L Severity-L	Improper arrangement may affect customer satisfaction. Top & bottom flat setting.	……..	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
Freezing	**Biological** Nil	No	…….	No biological contamination in this step -40^{0}C freezing activity in place.	……	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	…….	No source of physical contamination.	…….	No
	Quality Improper freezing	No	Likelihood-L Severity-H	Time & temperature fluctuation of block freezers may lead in to improper freezing.	…….	No But this step considers as CQP
De Panning	**Biological** Bacterial pathogen	No	Likelihood-H Severity-H	From food contact surface pan, lid covers, personnel. Use only sanitized pan cover, lids etc. Proper hand washing.	…….	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	……	No source of physical contamination.	…….	No
	Quality Nil	No	…….	Due to over defrosting glaze will affect. Ensure the uniform spray of water.	…….	No
Metal detector	**Biological** Nil	No	……	No source of microbial contamination.	…….	No
	Chemical Nil	No	……	No source of chemical contamination.	……	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Metal fragment	Yes	Likelihood-L Severity-H	Metal fragments may contaminate the product. It is hazardous to health.	Continuously all pouches pass through metal detector & record. Metal detector is periodically calibrated as per written procedure.	Yes CCP-2
	Quality Nil	No	……..	…….	……	No
Packing material inspection	**Biological** Nil	No	…….	Internal bacteriological report.	……	No
	Chemical Toxic printing ink	Yes	Likelihood-L Severity- M	Toxic printing ink may cause health hazard	No toxic printing ink used in printing & food grade materials are used.	No
	Physical Damage	No	Likelihood-L Severity-M	Damage packing materials from suppliers. External quality report for packing material. Declaration from manufacturer/Supplier.	……..	No
	Quality Quality of packing material	No	Likelihood-L Severity-M	Poor quality of packing material may affect the customer satisfaction. External quality report for packing material. Declaration from manufacturer /supplier.	……	No
Label / Packing	**Biological** Allergens	Yes	Likelihood-H Severity-H	Crustaceans are one of the major allergen that may allergic to some consumer.	Shrimps (Crustacean) are allergic to some consumer.	Yes CCP-3
	Chemical Toxic printing ink	Yes	Likelihood-L Severity- M	Toxic printing ink may cause health hazard	No toxic printing ink used in printing & food grade materials is used.	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Foreign material	No	Likelihood-L Severity-M	From foreign matters like rubber, staple pin, sign of pest infestation to avoid the foreign matters packing material inspection to be carried out as per sampling plan.	……	No
	Quality Quality of labels	No	Likelihood-L Severity -L	Poor quality printing, poor presentation of label may affect the customer specification. Label inspection to be carried out and compare with matter label.	…….	No
Cold storage	**Biological** Nil	No	…….	Not likely to occur because of cold storage are designed & maintained. Time & temperature monitoring & recording physical verification.	…….	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Temperature	No	Likelihood-H Severity-H	Temperature fluctuation from cold store may affect the product quality. Cold store temperature is maintained at -18^{0}C. Automatic temperature monitoring device connected with computer.	……	No
	Quality Appearance	No	Likelihood-H Severity- H	Improper maintenance of cold store may affect the quality of the product. Cold store is properly maintained FIFO system is followed.	…….	No
Shipment	**Biological** Nil	No	…….	Final product covered with protected polythene/ inner carton/ master carton and closed with self-adhesive tape.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<u>Chemical</u> Nil	No	……..	No chemical contamination in this step.	……	No
	<u>Physical</u> Nil	No	……	Not likely occur because frozen storage is maintained at -18^0 c temperature.	……	Nil
	<u>Quality</u> Temperature abuse and Improper handling	No	Likelihood-L Severity-L	Improper handling, temperature abuse and carton quality design, product may affect the customer satisfaction. Monitoring of incoming cartons, loading operation & temperature recording.	……	No But this step considers as CQP.

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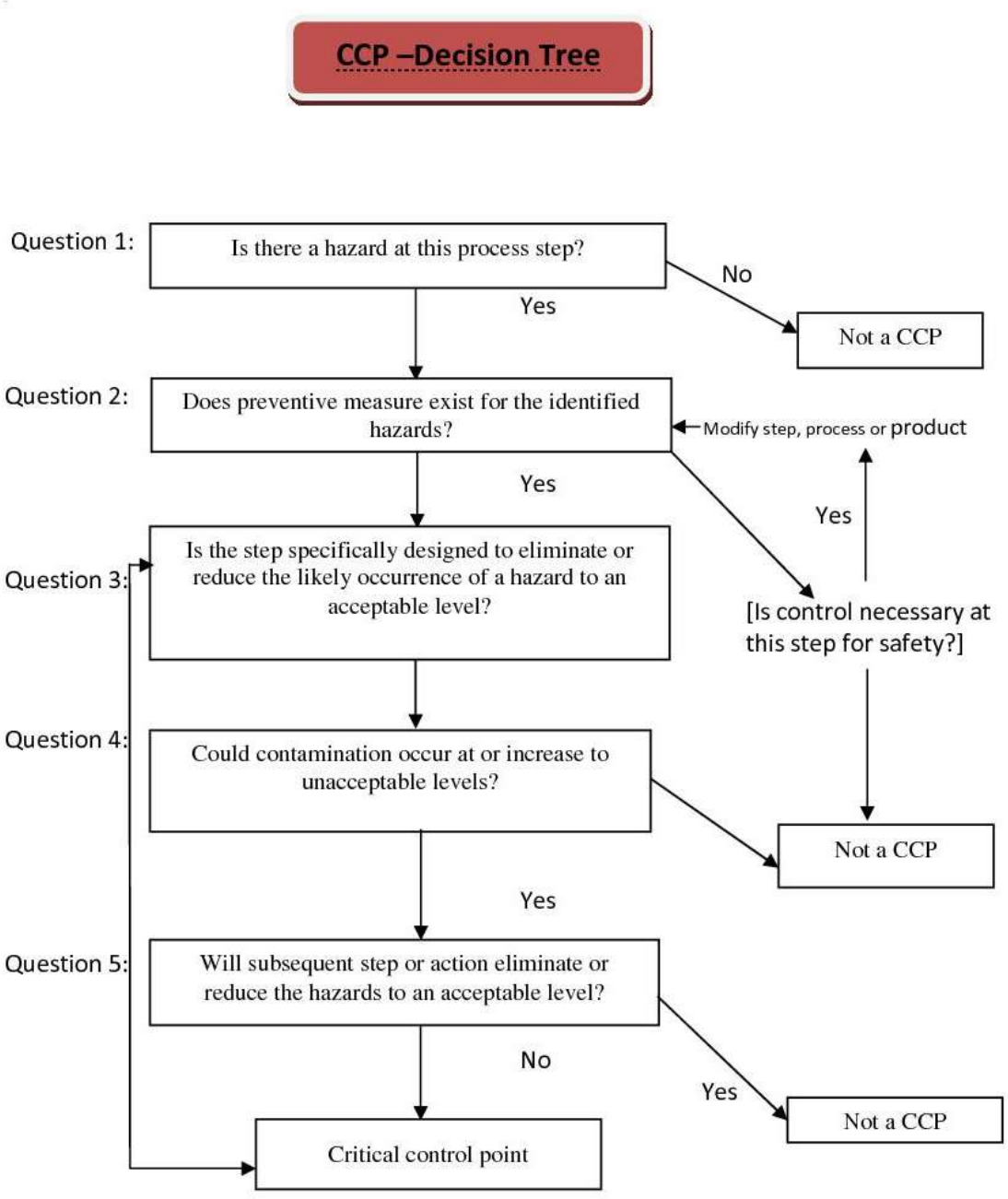
VI. CCP - Decision Tree



VII. CCP - Decision Tree Analysis

The decision tree is applied to all steps of hazard analysis worksheet and not limited to CCP alone.
Following is CCP determination for block raw frozen sea caught/wild caught shrimps:

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Raw material receiving	**Biological** -pathogen	Y	Y	Y	…	…	CCP	Survival of pathogenic bacteria from harvesting vessel and landing area. Sea caught/wild caught shrimps may have sulphite, pesticides, herbicides & antibiotic residues. It may cause illness to the consumer. Sulphite agents may cause allergic type reaction. There is no further step to control the hazard.
	Chemical -Antibiotic -pesticides -Sulphite -Herbicides	Y	Y	Y	…	…	CCP	
	Physical -Glass -wood -stone -plastic	Y	Y	N	Y	Y	Not a CCP	…….
	Quality -Black spot	Y	Y	N	Y	Y	Not a CCP	…….
Deicing/washing	**Biological** -Pathogen	Y	Y	N	Y	Y	Not a CCP	……..
	Chemical Nil	…	….	….	….	…..	…..	……..
	Physical Nil	….	……	….	…	….	……	……
	Quality Organoleptic	Y	Y	N	Y.	Y	Not a CCP	…….

Deheading	**Biological** Pathogen **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y …. …. Y	Y …. …. Y	N …. ….. N	Y ….. …. Y	Y …. ….. Y	Not a CCP …. ….. Not a CCP	……. ……. …… ……..
Grading	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y …. …. Y	Y …. …. Y	N …. ….. N	Y …. ….. Y	Y …. ….. Y	…. ….. ….. …..	…… ……. …… …….

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Peeling	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y …. …. Y	Y …. …. Y	N …. ….. N	Y …. ….. Y	Y …. ….. Y	Not a CCP ….. ….. Not a CCP	….. ……. …… …….
Washing	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Nil	Y …. …. ….	Y …. …. …	N …. ….. ….	Y …. ….. ….	Y …. ….. …..	Not a CCP ….. ….. …..	…… ……. …… …….

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Additives inspection	**Biological** Pathogens **Chemical** -phosphate -salt **Physical** Nil **Quality** Nil	Y Y …. ….	Y Y …. ….	N N ….. …..	Y Y ….. ….	Y Y ….. …..	Not a CCP Not a CCP ….. …..	….. ……. …… …….
Treatment	**Biological** Pathogens **Chemical** -phosphate **Physical** Nil **Quality** Organoleptic	Y N …. Y	Y …. …. Y	N … ….. Y	Y … ….. N	Y … ….. N	Not a CCP Not a CCP ….. CQP	….. ……. …… Excess residue of phosphate may lead to no acceptance.

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Final checking/weighing	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Organoleptic	Y	Y	Y	N	N	CQP	Defective pieces may be fed in to block
Label / Packing	**Biological** Pathogens (Allergens)	Y	Y	y	Y	Y	CCP-3	Crustaceans are one of the major allergen that may allergic to some consumer.
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Nil	….	…	….	….	…..	…..	…….

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Pan setting	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Nil	Y …. …. ….	Y …. …. …	N …. ….. ….	Y …. ….. ….	Y …. ….. …..	Not a CCP ….. ….. …..	…… ……. …… …….
Freezing	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Improper freezing	Y … …. Y	Y …. …. Y	N … ….. Y	Y …. ….. N	Y …. ….. N	Not a CCP …. ….. CQP	….. ……. …… Improper freezing affects the product & buyer acceptance.

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De panning	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Slab size & Appearance	Y …. …. Y	Y …. …. Y	N …. ….. N	Y …. ….. Y	Y …. ….. Y	Not a CCP ….. ….. Not a CCP	….. ……. …… …….
Metal detector	**Biological** Pathogens **Chemical** Nil **Physical** Metal fragment **Quality** Nil	Y …. Y ….	Y …. Y ….	N …. Y ….	Y …. N …	Y …. N ….	Not a CCP ….. CCP-2 ……	….. ……. Metal fragments may come into product. …….

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Packing material inspection	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Quality of packing material	Y …. …. Y	Y …. …. Y	N …. ….. N	Y …. ….. Y	Y …. ….. Y	Not a CCP ….. ….. Not a CCP	….. ……. …… …….
packing	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Improper labeling	Y … …. Y	Y …. …. Y	N … ….. Y	Y …. ….. N	Y …. ….. N	Not a CCP …. ….. CQP	….. ……. …… Improper labeling will lead to wrong identification of product.

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Cold storage	**Biological** Nil **Chemical** Nil **Physical** Nil **Quality** Organoleptic	…. … …. ….	…. …. …. ….	….. … ….. ….	….. …. ….. ….	…. …. ….. …	…… …. ….. …..	….. ……. …… ……..
Shipment	**Biological** Nil **Chemical** Nil **Physical** Nil **Quality** Damage carton	…. … …. Y	…. …. …. Y	….. … ….. N	….. …. ….. Y	…. …. ….. Y	…… …. ….. CQP	….. ……. …… Improper labeling, temperature abuse & carton quality may damage product.

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(Managing Director)

VIII. Justification of CCP Block Freezing (Sea Caught/Wild Caught)

Process step	CCP	Justification	
CCP-1 Raw material shrimps	Growth of pathogen	Growth of microbial pathogen	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)
	Sulphite	Presence of sulphite causes allergy to some consumer.	
CCP-2 Metal Detection	Metal fragment	Presence of metal causes physical injury to the consumer.	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)
CCP-3 Labeling/ packing	***Clostridium botulinum*** toxin formation during storage Shrimps(Allergens)	***C. botulinum*** toxic formation during finished product storage which leads to symptoms like weakness, vertigo, swallowing and frequently abdominal swelling, consumption, paralysis & death. Crustaceans are one of the major allergen that may allergic to some consumer.	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)

IX. Justification Block Freezing Sea Caught/ Wild Caught (Critical Limit)

PROCESS STEP	CCP	CRITICAL LIMIT	REFERENCE
CCP-1 Raw material Receiving	Growth of microbial pathogen.	Temperature of the material should be <4^{0}C	USFDA Regulation and Codex Alimentarius guidelines 5.3(CAS.RCP 1-1969, Rev. 4-2003) Detection Limit: Chloramphenicol: 0.3ppb Nitrofuran :1.0ppb
	Sulphite	Maximum permissible limit is – Nil	
CCP-2 Metal Detector	Metal fragment	Ferrous : 1.5mm Non ferrous : 2.0mm Stainless Steel : 2.0mm	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003)
CCP-3 Labeling /Packing	Finished product Storage (***Clostridium botulinum***) **Crustaceans (shrimps)**	Maximum cooler temperature -18^{0}C Crustaceans are one of the major allergen.	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003) USFDA Food Allergen Labeling and Consumer Protection Act of 2004 (Public Law 108-282, Title II)

X. Justification of CQP Block Freezing

PROCESS STEP	**HAZARDS**	**CRITICAL LIMIT**	**JUSTIFICATION**
CQP-1 Chemical treatment	Residual phosphate in excess of the critical limit.	5000ppm	Agreement with buyers.
CQP-2 Final checking	Organoleptically defective pieces.	As per finished product specification.	Agreement with buyers
CQP-3 Freezing	Improper freezing.	Core temperature of product must be not less than -18^{0}C	In-house /industry specification.
CQP-4 Weighing/packing /labeling	1.Short weight 2. Wrong labeling/packing.	As per buyer's specification.	Agreement with buyers
CQP-5 Shipment	1. Core temperature of product while loading. 2. Master carton quality while loading.	Must not be less than -18^{0}C. Damaged /quality compromised cartons.	In-house/industry/Buyer's specification.

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(Managing Director)

XI. HACCP (CCP) Plan Form For Sea-caught/Wild-caught Shrimps (BLOCK)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

Approval No.**370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **BLOCK FROZEN**
(H/ON, H/L, PD, PUD, PDTO, EZPEEL) SEA CAUGHT/ WILD CAUGHT SHRIMP

Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		
CCP-1 Raw material head on receiving stage	**<u>Sulphite</u>**	Absent	Residue of sulphite content.	. Do the sulphite analysis test.	. Each lot of raw material received.	Q.C Technologist	If it is positive, action will be taken against suppliers. Remove the supplier from approved list.	Sulphite test record.	Review sulphite analysis test report.

1	2	3	4					5	6
	Biological Growth of microbial pathogen	Temperature of raw material should be <4^{0}C	Temperature of raw material	By thermometer	Each lot of raw material received	Q .C Technologist	Reject the lot if raw material temperature is >4^{0}C	Raw material receiving register Bacteriological register. Thermometer calibration record	Review of the: Raw material temperature records. Bacteriological register Thermometer calibration record.

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1	2	3	4					5	6
CCP-2 Metal detection	Metal fragment	Fe :1.5mm Non Fe :2.0mm SS: 2.0mm	Metal fragments	Each block passing through metal detector	Continuously	Packing supervisor	The detected slab is removed and put in a locked box. The production manager /general manager unlock the box and defrost the slab. Divided in to 4 parts. Pass each individual piece through metal detector. If any individual detected, take the pieces cut with knife and analysis metal fragment. Then take out defected pieces. Before passed slab also take & recheck /pass through metal detector.	Metal detector records.	CCP-2 verification of metal detection Before starting the process pre operation checking has done with standard test pad then also periodically verification carried out every 30 minutes. Verification done once in a week.
CCP-3 (Packing material & Labeling)	Shrimps, ***botulinum toxin*** formation during finished product storage.	All finished product labeled with "containing shrimps" All finished product labeled with	Finished product labeling statement "contains Shrimp" & "Keep Frozen at or below -18^{0}C"	By visual	Label on each carton	Supervisor/ QA/ QC / Production In-charge/ Package executive/ Managing Director	Segregation of the lot at re-labeling	Label approval record	Review in once in a week

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1	2	3	4					5	6
		"Keep Frozen at below -18^{0}C"							

XII. HACCP (CQP) Plan Form For Sea-Caught/Wild-Caught Shrimps (Block)

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		

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CQP-1 Chemical treatment	Phosphate residue	Max. 5000 ppm	Phosphate residue testing.	Chemical analysis through strip method.	Daily source wise.	Q.C Technologist	If phosphate exceeds limit label on the master carton level of ppm	Soaking monitoring records.	Phosphate residual reports are verified by Q.A manager.
CQP-2 Final checking	Organoleptic	20%	Checking of defective pieces.	By online checking.	continuously	Q.C Technologist	Continuous training to improve skill.	pre-freezing inspection record(Block)	Daily verification of pre freezing inspection record.
CQP-3 Freezing	Improper freezing	Min -18^{0}C	Temperature monitoring of frozen products.	Check freezing time and core temperature of product.	continuously	Production supervisor.	Segregate improperly frozen product & re-freeze.	Monitoring record for freezing block.	Daily verification of freezing monitoring record.
CQP-4 Weighing/ packing /labeling	Wrong labeling & packing	Nil	Labeling & packing operation.	by visual check of packing process	continuously	Production & packing supervisor	Check for any mislabeling, printing and correct it.	Block packing record.	Daily verification of packing record.
CQP-5 Shipment	Temperature	-18^{0}C	Monitoring loading temperature	Check temperature of container & cargo.	Every shipment	Cold store supervisor / Q.C technologist	Stop loading until the temperature is achieved.	Shipment details record.	Q.A to verify shipment detail record for each shipment.

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XIII. Predetermined Corrective /Preventive Action

A. When Antibiotic/Sulphite Residue (CCP-1) Exceed Critical Limit

a) Immediate corrective action:

Identify affected lots through, source code and withdraw day code and withdraw all such lots from the processing floor as well as cold stores.

Tally the total withdrawn lots for quantity.

b) Preventive action:

The supplier is traced back from the source –code and /or day code and removed from approved suppliers list to get rid of unworthy business alliance (his supplier declaration proves his untrustworthiness)

c) Corrective action records:

CCP verification & corrective action reports for Antibiotic and sulphites.

B. When Metal Detection Exceed (CCP-2) Critical Limits

a) Immediate corrective action:

The detected pouches /slabs are keeping as non-conformance in de marked cold store area.

b) Preventive action:

The entire process line is traced and checked thoroughly for any possibility of loose metal, rust scrap etc. and any such situation upon notice is corrected.

c) Corrective action records:

An NCR is raised and corrective action with regard to the same is reported back using the CCP verification and corrective action format for metal detector.

C. When Packing Material & Labeling (CCP-3) Critical Limits

a) Immediate corrective action:

Segregate and return or destroy any label stock or pre- labels packing stock that does not contain the proper statement.

Determine and correct the cause of improper labels.

b) Preventive action

i. Finished products label for the presence of a “keep frozen” & “contains shrimp” statement.

ii. Visual examination.

iii. Representative number of package from each lot products.

iv. Any person who has an understanding of the natural of controls.

c) Corrective action record

Record of labeling checks.

16. Fresh Frozen Raw Sea-Caught / Wild-Caught Shrimps (IQF)

I. Description of Raw Sea-Caught / Wild-Caught Shrimps (IQF)

Source of Raw Material	Fresh raw material purchased from approved suppliers (Seecatch/Wild catch material)
Product	IQF Raw Shrimps
Varieties	Head on – shrimps (H/on)
	Headless Shell-on Shrimps (HL, EZ PEEL)
	Peeled Deveined Tail-on (PDTO, Round cut)
	Peeled Deveined Tail-on (BUTTERFLY 90% Cut)
	Peeled Un deveined Tail-off (PUD, Round cut)
Packing	4 x 2.5Lbs, 10x2Lbs, 6x1.2Kg,6x1Kg, 10x2lbs, etc., (Type of pack and Pouch / M/c as per buyer's requirements)
Storage conditions	-18 Degree centigrade
Shelf life of the product	24 months from the production date or as per the specification of importing countries.
Method of Preservation	Individual Quick Freezing (IQF)
Additives used	Salt and Sodium-Tri-Poly-Phosphate (STTP) as per buyer's requirement
Distribution	To all countries by refrigerated carriers (including E.U Countries, Russian Federation & Australia)). If we exported uncooked prawns to Australia, each batch tested on arrival in Australia and found to be free of WSSV and YHV. When we export the products for Russian Federation the sample is free from manmade radionuclide contamination. Sample is fit for human consumption from radiological point of view.
Intended use by customer	To be consumed by general public When thawing, we recommend …… Place Bag of shrimps overnight into the refrigerator or empty desire amount into a container of cool water for approximately 5 minutes' drain. It's now ready for cooking. Re-freezing thawed product is not recommended.

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(Managing Director)

II. Production Flow Chart for Fresh Frozen Raw Wild/Sea Caught Shrimps(IQF)

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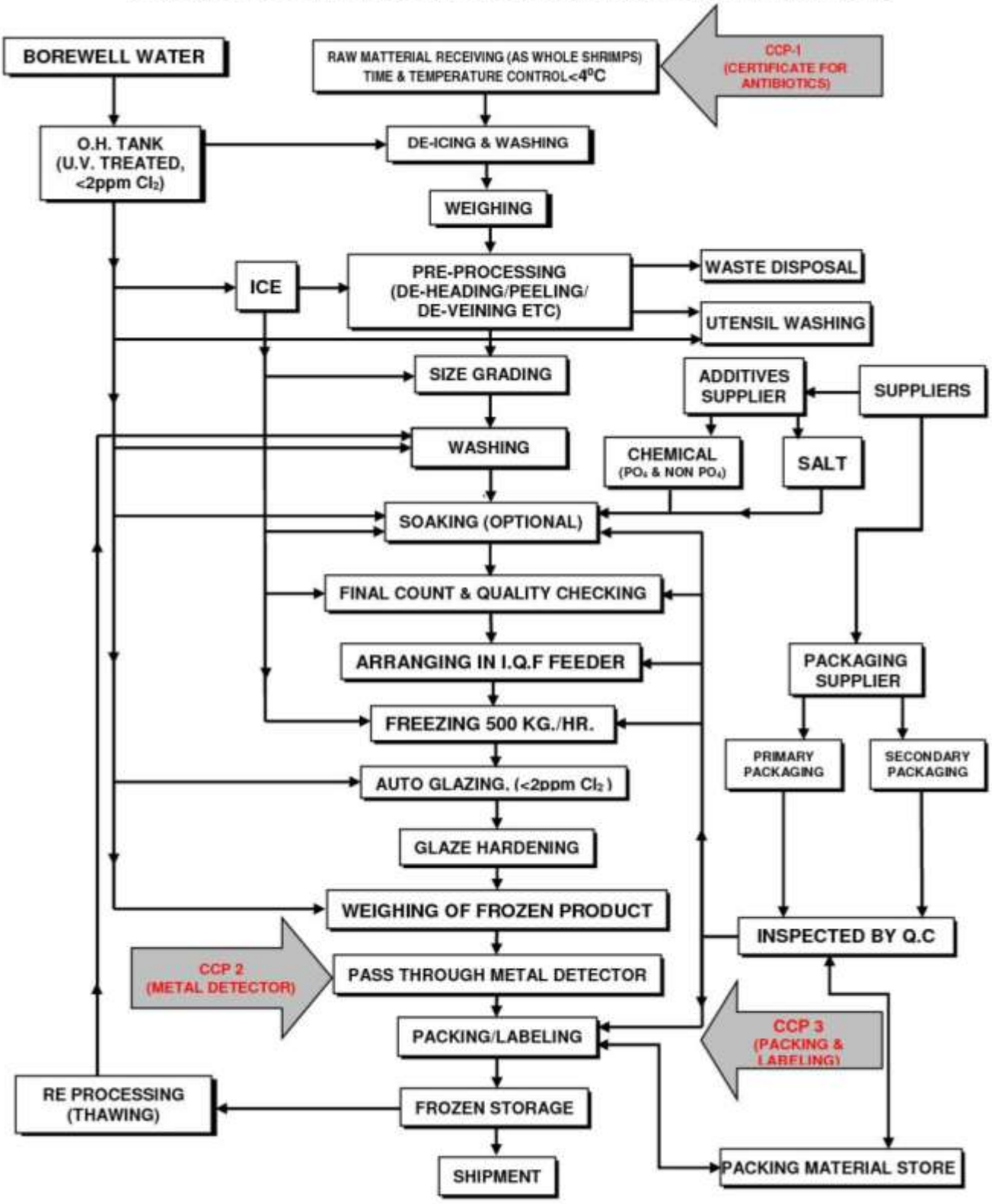
PRODUCTION FLOW CHART FOR FRESH FROZEN RAW WILD/SEA CAUGHT SHRIMPS(IQF)



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III. Processing Steps of Fresh Frozen Raw Sea-Caught Shrimps (Process Description)

- The heads alone of the prawns are removed, leaving the entire shells and tails intact;
- The vein (intestine) is pulled out as far as possible from the severed head portion; hanging meat along with the red membrane is removed.
- Washed well after de-heading;
- Discolored, bruised and soft-shelled pieces at the grading time are discarded.
- For IQF products, size, grade and variety-wise the materials are graded and soaking (optional) with 2% salt, 3% STPP, 40% Water and 60% Ice and stirring for 1 and ½ hour) and then fed to the IQF feeder individually before freezing and then only the frozen products are weighed, glazed and packed as per buyer's requirement.
- For peeled shrimps the shell is completely removed and either or vein is removed by sharp knife. Dehydrated & discolored smelling pieces are segregated and rejected.
- Peeled material is thoroughly washed in perforated tub and re-iced properly.
- Graded materials fed to the IQF feeder individually before freezing and then only the frozen products are weighed, glazed and packed as per buyer's requirement.
- In HL type of product, the flavor and nutrients is maximum due to the protection offered by the shell.

IV. On site verification of process flow raw IQF Sea caught/ Wild Caught shrimps

Whole shrimps are received at the receiving room through landing platform of Pre-Processing section. Each batch of raw materials are properly deiced and check temperature <4^{0}Cand washed with potable water. Materials supplied by different suppliers are tagged with labels with detailed information. Materials of a particular variety are accepted at a time after satisfying the raw material acceptance criteria (Appendix-III) and rejected the materials which are not satisfied the acceptance criteria. Rejected materials are taken in crates with tag rejected and handed over to the agent/supplier after the batch is over. Purchase supervisor accepts the materials based on accepting criteria and records his observation in the raw material receiving log (Annexure-I). After proper washing with chlorinated water of < 2 ppm. strength and weighing, the head on materials are adequately iced in sanitized crates and kept in the chilled room of pre-processing section, maintained the temperature below +4^{0}Cor sent to the preprocessing section directly, if no more balance material is there. This operation is completed within minimum time. A time temperature log for the chill room is maintained by the supervisor to keep a check on temperature abuse. At the time of de-heading or peeling etc., adequate and experienced workers are engaged to ensure quick completion of the activity. During the operation, adequate flake ice is used to maintain the temperature below +4^{0}C. The headless or peeled materials are further washed with Chlorinated water of <2 ppm. Strength and adequately iced in sanitized crates. Raw material samples drawn for microbiological/antibiotic test as per the schedule.

After receiving in the processing section, prior to grading each crate of material is de-iced and washed with chlorinated potable water. To minimize the cumulative exposure of material to high temperature, delay during manual grading is avoided. The graded materials are adequately iced and kept in plastic crates. To avoid time temperature abuse, excess materials are stored in the chill room or insulated boxes in the processing section with adequate ice. For time temperature log of chill room maintained to keep a check of temperature abuse.

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The graded headless materials are deiced and taken for wash to remove the filth. In case of peeled materials, after deicing the materials are fed into the automatic grading cum filth washing machine to remove the filth. Prior final weighment of the slabs each individual grade of single variety is washed with chlorinated water <2 ppm. Strength and taken on perforated table to drain out the excess water. At this stage the code slip in addition to the mandatory information also incorporated.

For IQF products the washed products are directly fed to the IQF feeder and after freezing the materials are weighed and glazed and then packed into the master carton as per the buyer's specification. Master Cartons are stored in cold storage maintained at below – 18^0C. Records of cold storage are maintained through an automatic temperature recording thermograph (Annexure-XXXV).

Following the day's production, the product is tested code wise, type wise of Organoleptic and Bacteriological examination by approved technologist (Lab). The same are recorded (Annexure-XVIII, XIX, XX, XXI, XXII,). A particular lot is approved for shipment if the lot satisfies the quality criteria of the competent authority and that of the importing country.

Besides as per our practice samples are drawn randomly for test of antibiotic residue to a level of .01 ppb by HPLC-LCMSMS Method particularly for chloramphenicol and Nitrofuran groups in EIC approved Laboratory. Records are maintained by technologists. For any type of products, materials are accepted on supplier's guarantee. Pesticides, antibiotics drug and heavy metals (Hg, As, Cd, Pb, Ni, Cr & Sn) salts and STPP are tested as follows:

Antibiotics, Heavy Metals and Pesticides residue is tested at EIC approved LAB for raw material once in two months and covering different sources/suppliers on rotation basis and also finished products testing is done consignment-wise before each shipment.
SALT-Salt is tested for staphylococcus and sulphite reducing clostridium once in six months if same batch is continued otherwise tested every batch at EIC approved laboratories.
STPP-The permissible percentage of phosphate in finished products are tested once in six months by EIC approved laboratory. Antibiotics, Heavy Metals and Pesticides are sent to EIA / SEA LAB for residue analysis as specified by the local EIA for which the sample is drawn by EIA.

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(Managing Director)

V. Hazard Analysis Worksheet for Fresh Frozen Raw Shrimps (IQF)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

Approval No.**370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **IQF**
(H/ON, H/L, PD, PUD, PDTO, EZPEEL) SEA CAUGHT/ WILD CAUGHT SHRIMPS

Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
INGREDIENTS/PROCESSING STEP	**IDENTITY POTENTIAL HAZARDS INTRODUCED/ CONTROLLED OR ENHANCED AT THIS STEP**	**ARE ANY POTENTIAL FOOD SAFETY HAZADOUS SIGNIFICANT? (YES/NO)**	**INDICATE LIKELIHOOD & SEVERITY OF HAZARD, HIGH-H; MEDIUM-M; LOW-L**	**JUSTIFY YOUR FOOD SAFETY HAZARDS FOR COLUMN 3**	**WHAT CONTROL CRITICAL DECISION MEASURES CAN BE APPLIED FOR THE SIGNIFICANT HAZARDS**	**IS THIS STEP CCP/CQP (YES/NO**
Receiving whole shrimps at raw material receiving section	Biological Bacterial pathogen growth	Yes	Likelihood-H Severity-H	Raw materials are always having high load of pathogen	Proper time temperature control Raw materials temp <4^{0}Cif more reject the lot. ➢ GMP ➢ SSOP ➢ SOP at processing plant.	Yes CCP-1

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chemical sulphite	Yes	Likelihood-H Severity-H	sulphite residue are toxic & potential allergen and that may cause cancer.	Supplier Declaration	Yes CCP-1
	Physical Metal fragment, stone, plastic, wood & objection able foreign materials	No	Likelihood- L Severity-H	All sorts of physical contamination are possible & cause injuries to consumer acceptance.	……	No
	Quality Organoleptic	No	Likelihood-M Severity -H	Affects finished products quality due to improper handling, lack of improper icing, improper storage in crates	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
Deicing, washing, Weighing	Biological Bacterial pathogen growth	No	Likelihood-M Severity -H	From food contact surfaces, workers handling, time delay, temperature fluctuation. proper layer icing, maintained temperature below 4^0C	……	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Nil	No	…….	No physical contamination at this step	……	No
	Quality organoleptic	No	Likelihood –L Severity - L	Maintain raw material temperature below 4^0C	……..	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
Re-icing	**Biological** Bacterial pathogen	No	Likelihood-L Severity -L	Proper time temperature control (SSOP) Food contact surfaces Contaminate ice may cause pathogen growth.	…….	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Foreign material	No	Likelihood-L Severity -H	From food contact surface like broken plastic & metal pieces etc.	…….	No
	Quality Temperature	No	Likelihood-L Severity -M	From temperature abuse of the raw material may affect the quality.	…….	No
Deheading /peeling/deveining/filth washing etc.	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food contact surface, time temperature control, proper layer icing & using chill water.	…….	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Nil	No	……	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No
	Quality Organoleptic	No	Likelihood-L Severity-L	Hanging meat / red meat may affect consumer acceptance. proper trimming of red meat, SOP if Deheading procedure	…….	No
Deicing & size grading	**Biological** Bacterial pathogen	No	Likelihood –L Severity -H	From food contact surface & personnel hygiene, proper time /temperature control. Proper icing of grading materials.	…….	No
	Chemical Nil	No	…….	No source chemical contamination.	…….	No
	Physical Nil	No	…….	From the damage food contact surface (table) metal fragment. All tables are made by stainless steel.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Quality Organoleptic	No	Likelihood-L Severity -M	Wrong grading, defective/wrong pieces may exceed the specification, /uniformity ratio. Proper sorting /checking using trained man power. Proper labeling of source code, grade.	…….	No
Additives inspection	**Biological** Bacterial pathogen	No	Likelihood-L Severity -H	In salt clostridium bacteria may be chance. Lot wise analysis of clostridium bacteria by external lab.	…….	NO
	Chemical Food grade	No	Likelihood-L Severity -H	Salt & carnal might have health hazards chemicals. MSDS /food grade certificate from manufacturer/ suppliers.	……..	No
	Physical Pest infestation	No	Likelihood-L Severity -H	From pest infestation & other physical character may affect quality of the products.	……	No
	Quality Free flow, moisture, appearance	No	Likelihood –L Severity -H	Quality of salt, carnal additives is inspected as per sampling plan & recorded.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	**Biological** Bacterial pathogen	No	Likelihood-L Severity-H	May contaminated water causes pathogen growth. Proper schedule & monitoring of hygiene & sanitation activity, time /temperature control.	…….	No
	Chemical Salt, carnal	No	Likelihood-L Severity- H	Excess salt & phosphate residue may lead to buyer non-acceptance. Use of quantified chemicals, adherence to treatment specs and issue register & also additional checking to be done.	…….	No
	Physical Nil	No	…….	No source of physical contamination	…….	No
	Quality organoleptic	No	Likelihood-L Severity-H	Treatment may generate defective pieces. Gentle agitation through agitator & trained employees involved in this process. Excessive use of chemical will lead to bitter test and loss of texture.	…….	No But this step considers as CQP.

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
Washing/Draining/Final count & sorting	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food handler's personnel hygiene & food contact surface. All food handlers should be checked personnel hygiene and the same recorded. Food contact surface sanitized as written procedure.	……..	No
	Chemical Nil	No	……	No chemical contamination at this step.	…….	No
	Physical Nil	No	.....	From food contact surface, from food handlers. Crates & nets are made by hard plastic as per policy monitoring & verification (broken & damaged in place and also to avoid metal fragment table to make by SS. To avoid unsecure jewelry all food handler is checked before enter the processing area and recorded the same.	……	No
	Quality Organoleptic	No	Likelihood –L	More defective pieces may be going to on slab. Trained /skilled employees are	…….	No But this step

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Severity-L	provided to check the defective pieces. Randomly checking of pre freezing inspection & same to be recorded.		considers as CQP
Arranging in IQF feeder	**Biological** Bacterial pathogen	No	Likelihood-L Severity-L	From food contact surface of trays, nets etc. From Personnel hygiene of food handlers. Proper cleaning & sanitization of trays & nets. Periodical hand sanitation.	……	No
	Chemical Nil	No	……	No source of chemical contamination.	…….	No
	Physical Nil	No	……	No source of physical contamination.	…….	No
	Quality Nil	No	……	Improper arrangement may affect customer satisfaction. Individual quick frozen to avoid clumping of pieces.	…….	No
Freezing	**Biological** Nil	No	…….	No biological contamination in this step - 40^0Cfreezing activity in place.	……	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	…….	No source of physical contamination.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Quality Improper freezing	No	Likelihood-L Severity-H	Time & temperature fluctuation of IQF freezer may lead in to improper freezing. Controlled, monitor time & temperature of IQF freezer.	…….	No But this step considers as CQP
Glazing	**Biological** Bacterial pathogen	Yes	Likelihood-L Severity-L	Addition of microbes thorough impure water. Controlled by SSOP, regular cleaning of chilling tanks and spray nozzles.in house bacteriological report.	…….	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Nil	No	…….	No source of physical contamination.	…….	No
	Quality Nil	No	…….	Due to over defrosting glaze will affect. Ensure the uniform spray of water. controlled by SOP.	…….	No But this step considers as CQP.
Glaze Hardening	**Biological** Nil	No	……	No source of microbial contamination. - 40^0Chardening in place.	…….	No
	Chemical Nil	No	…….	No source of chemical contamination.	……	No
	Physical Nil	No	……..	No source of physical contamination.	……..	No
	Quality Nil	No	……..	…….	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
Packing material inspection	**Biological** Nil	No	…….	Internal bacteriological report.	……	No
	Chemical Toxic printing ink	Yes	Likelihood-L Severity- M	Toxic printing ink may cause health hazard	No toxic printing ink used in printing & food grade materials are used.	No
	Physical Damage	No	Likelihood-L Severity-M	Damage packing materials from suppliers. External quality report for packing material. Declaration from manufacturer/Supplier.	……..	No
	Quality Quality of packing material	No	Likelihood-L Severity-M	Poor quality of packing material may affect the customer satisfaction. External quality report for packing material. Declaration from manufacturer /supplier.	……	No
Pouching/ Weighing	**Biological** Bacterial pathogen	Yes	Likelihood-L Severity-L	Packing supplier poor handling their facility may chance microbial contamination.	……..	No
	Chemical Nil	No	……	No source of chemical contamination at this Sep.	……..	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Nil	No	…….	No source of physical contamination at this step.	…….	No
	Quality pouch sealing	Yes	Likelihood-L Severity -M	Improper sealing of pouches may affect customer satisfaction. Use only very good condition sealer & also check the status of the sealing. Confirmed to customer specification.	Controlled by GMP.	No
Metal detection	**Biological** Nil	No	…….	No source of microbial contamination at this step.	……..	No
	Chemical Nil	No	…….	No chemical contamination at this step.	…….	No
	Physical Metal fragment	Yes	Likelihood-L Severity-H	Metal fragment may contaminate the product. It is hazard to health.	Continuously all pouches pass through metal detector & record. Metal detector also calibrated.	Yes CCP-2
	Quality Nil	No	……	…….	…….	No
Packing	**Biological** Nil	No	…….	No source of microbial contamination.	……	No

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(Managing Director)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No
	Physical Damage	No	Likelihood-L Severity -M	Damage packing materials from suppliers. External quality report for packing material. Declaration from manufacturer/Supplier.	……	No
	Quality Quality of packing material	No	Likelihood-L Severity-M	Poor quality of packing material may affect the customer satisfaction. External quality report for packing material. Declaration from manufacturer /supplier.	…….	No
Cold storage	**Biological** Nil	No	…….	Not likely to occur because of cold storage are designed & maintained. Time & temperature monitoring and recording physical verification.	……	No
	Chemical Nil	No	…….	No source of chemical contamination.	…….	No

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(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Physical Temperature	No	Likelihood-H Severity-H	Temperature fluctuation from cold storage may affect the product quality. Cold storage temperature is maintained -18^{0}C automatic temperature monitoring device connected with computer.	……	No
	Quality Appearance	No	Likelihood-H Severity-H	Improper maintenance of cold stores may affect the quality of the products. Cold storage is properly maintained. FIFO system is followed.	No	…….
Shipment	**Biological** Nil	No	…….	Final product covered with protected polythene/ inner carton/ master carton and closed with self-adhesive tape.	…….	No
	Chemical Nil	No	…….	No chemical contamination in this step.	……	No
	Physical Nil	No	……	Not likely occur because frozen storage is maintained at -18^0 c temperature.	……	Nil
	Quality Temperature abuse and Improper handling	No	Likelihood-L Severity-L	Improper handling, temperature abuse and carton quality design, product may affect the customer satisfaction. Monitoring of incoming cartons, loading operation & temperature recording.	……	No But this step considers as CQP.

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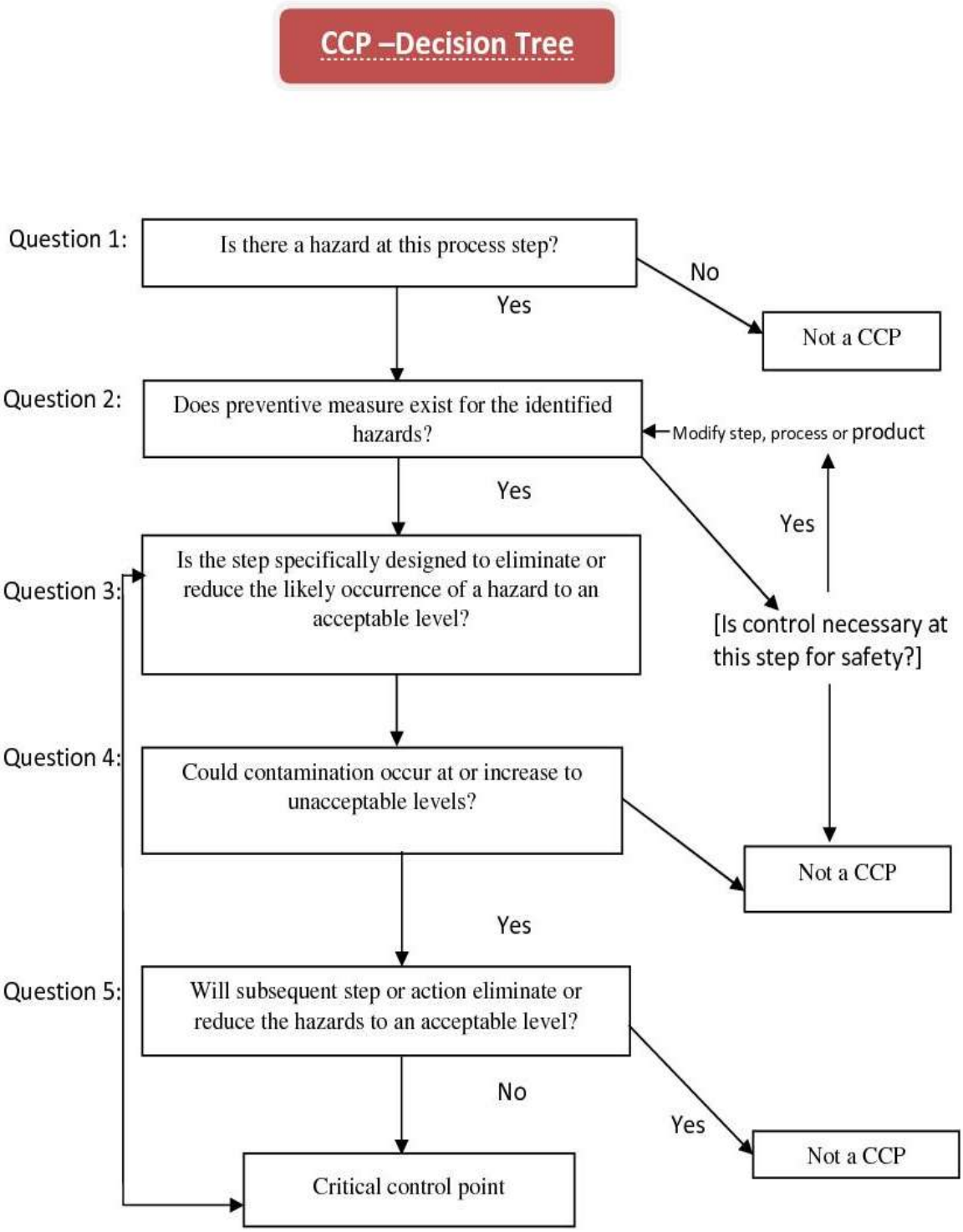
VI. CCP - Decision Tree



VII. CCP - Decision Tree Analysis

The decision tree is applied to all steps of hazard analysis worksheet and not limited to CCP alone.
Following is CCP determination for IQF raw frozen sea caught/ wild caught shrimps:

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Raw material receiving	**Biological** -pathogen **Chemical** -Sulphite **Physical** -Glass -wood -stone -plastic **Quality** -Black spot	Y Y Y Y	Y Y Y Y	N Y N N	Y N Y Y	Y N Y Y	CCP CCP Not a CCP Not a CCP	Survival of pathogenic bacteria from fishing vessel or landing area. Shrimps may have sulphite residues; It may cause illness to the consumer. Sulphite agents may cause allergic type reaction. There is no further step to control the hazard. ……. …….
Deicing/washing	**Biological** -Pathogen **Chemical** Nil **Physica**l Nil	Y … ….	Y …. ……	N …. ….	Y …. …	Y ….. ….	Not a CCP ….. ……	…….. …….. ……

Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
	Quality Nil	….	….	….	….	…..	….	…….
Deheading	**Biological** Pathogen **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y …. …. ….	Y …. …. ….	N …. ….. ….	Y ….. …. ….	Y …. ….. ….	Not a CCP …. ….. ……	……. ……. …… ……..
Grading	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y …. …. Y	Y …. …. Y	N …. ….. N	Y …. ….. Y	Y …. ….. Y	Not a CCP ….. ….. Not a CCP	…… ……. …… …….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Peeling	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	….. Not a CCP	……
	Quality Organoleptic	Y	Y	N	Y	Y		…….
Washing	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	……
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Nil	….	…	….	….	…..	…..	…….

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
Additives inspection	**Biological** Pathogens **Chemical** -phosphate -salt **Physical** Nil **Quality** Nil	Y Y …. ….	Y Y …. ….	N N ….. …..	Y Y ….. ….	Y Y ….. …..	Not a CCP Not a CCP ….. …..	….. ……. …… …….
Treatment	**Biological** Pathogens **Chemical** -phosphate **Physical** Nil **Quality** Organoleptic	Y Y …. Y	Y Y …. Y	N N ….. N	Y Y ….. Y	Y Y ….. Y	Not a CCP Not a CCP ….. CQP	….. ……. …… Excess residue of phosphate may lead to non-acceptance.
Final checking/weighing	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
	Chemical Nil **Physical** Nil **Quality** Organoleptic	… …. Y	…. …. Y	… ….. N	…. ….. Y	…. ….. Y	…. ….. CQP	……. …… Defective pieces may be fed in to IQF freezer.
Feeding	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** Organoleptic	Y …. …. Y	Y …. …. Y	N …. ….. N	Y …. ….. Y	Y …. ….. Y	Not a CCP ….. ….. Not a CCP	…… ……. …… …….
IQF freezing	**Biological** Nil **Chemical** Nil **Physical** Nil **Quality**	…. …. ….	….. …. ….	….. …. …..	….. …. …..	…. …. …..	….. ….. …..	…… ……. ……

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
	Improper freezing	Y	Y	Y	N	N	CQP	Improper /insufficient glaze may affect buyer's acceptance & shelf life.
Hardening	**Biological** Nil **Chemical** Nil **Physical** Nil **Quality** Nil	….. … …. ….	….. …. …. …..	…… … ….. …..	….. …. ….. …..	….. …. ….. ……	…. …. ….. …..	….. ……. …… ……..
Weighing / Pouching	**Biological** Pathogens **Chemical** Nil **Physical** Nil **Quality** packing	Y …. …. Y	Y …. …. Y	N …. ….. Y	Y …. ….. N	Y …. ….. N	Not a CCP ….. ….. CQP.	….. ……. …… Packing may affect customer acceptance and reputation.
Metal detector	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Metal fragment	Y	Y	Y	N	N	CCP-2	Metal fragments may come into product.
	Quality Nil	….	….	….	…	….	……	…….
Packing material inspection	**Biological** Pathogens	Y	Y	N	Y	Y	Not a CCP	…..
	Chemical Nil	….	….	….	….	….	…..	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Quality of packing material	Y	Y	N	Y	Y	Not a CCP	…….
packing /labeling	**Biological** Pathogens (Allergen)	Y	Y	N	Y	Y	CCP-3	Crustaceans (Shrimps) are allergen to some of the consumer.
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
	Quality Improper labeling	Y	Y	Y	N	N	CQP	Improper labeling will lead to wrong identification of product.
Cold storage	**Biological** Nil	….	….	…..	…..	….	……	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Nil	….	….	….	….	…	…..	……..
Shipment	**Biological** Nil	….	….	…..	…..	….	……	…..
	Chemical Nil	…	….	…	….	….	….	…….
	Physical Nil	….	….	…..	…..	…..	…..	……
	Quality Damage carton	Y	Y	Y	N	N	CQP	Improper labeling, temperature

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Process step	Hazard	Q1 (Y/N)	Q2 (Y/N)	Q3 (Y/N)	Q4 (Y/N)	Q5 (Y/N)	CCP /CQP or not	Justifying decision for CCP/CQP
								abuse & carton quality may damage product.

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VIII. Justification of CCP IQF (Sea-Caught/Wild-Caught)

Process step	CCP	Justification	
CCP-1 Raw material shrimps	Growth of pathogen	Growth of microbial pathogen	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)
	Sulphite	Presence of sulphite causes allergy to some consumer.	
CCP-2 Metal Detection	Metal fragment	Presence of metal causes physical injury to the consumer.	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)
CCP-3 Labeling /Packing	Finished product Storage (***Clostridium botulinum***) **Crustaceans (shrimps)**	Maximum cooler temperature -18^{0}C Crustaceans are one of the major allergen.	This is the last stage at which hazards can be controlled, hence this steps are Critical Control Point. (CCP)

IX. Justification IQF Sea-Caught/ Wild-Caught (Critical limit)

PROCESS STEP	CCP	CRITICAL LIMIT	REFERENCE
CCP-1 Raw material Receiving	Growth of microbial pathogen.	Temperature of the material should be <4^{0}C	USFDA Regulation and Codex Alimentarius guidelines 5.3(CAS.RCP 1-1969, Rev. 4-2003) Detection Limit: Chloramphenicol: 0.3ppb Nitrofuran :1.0ppb
	Sulphite	Maximum permissible limit is – Nil	
CCP-2 Metal Detector	Metal fragment	Ferrous : 1.5mm Non ferrous : 2.0mm Stainless Steel : 2.0mm	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003)
CCP-3 Labeling /Packing	Finished product Storage (***Clostridium botulinum***) **Crustaceans (shrimps)**	Maximum cooler temperature -18^{0}C Crustaceans are one of the major allergen.	Codex Alimentarius guidelines 5.2.5(CAC/RCP1-1969, Rev.4-2003) USFDA Food Allergen Labeling and Consumer Protection Act of 2004 (Public Law 108-282, Title II)

X. Justification of CQP IQF

PROCESS STEP	HAZARDS	CRITICAL LIMIT	JUSTIFICATION
CQP-1 Chemical treatment	Residual phosphate in excess of the critical limit.	5000ppm	Agreement with buyers.
CQP-2 Final checking	Organoleptically defective pieces.	As per finished product specification.	Agreement with buyers
CQP-3 Freezing	Improper freezing.	Core temperature of product must be not less than -18^0C	In-house /industry specification.
CQP-4 Glazing	Improper of insufficient glaze.	As per buyer's specification.	Agreement with buyers
CQP-5 Weighing/packing	Short weight, wrong labeling/ packing	As per buyer's specification.	Agreement with buyers
CQP-6 Shipment	Core temperature of product while loading. Master carton quality while loading.	Must not be less than -18^0C. Damaged /quality compromised cartons.	In-house/industry/Buyer's specification.

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XI. HACCP (CCP) Plan Form for Sea Caught/ Wild Caught Shrimps (IQF)

Firm Name:
RAM'S ASSORTED COLD STORAGE LTD

Approval No.**370**

Firm Address: Arakhakuda, Telengapenta, Cuttack-51

Product Description: **IQF**
(H/ON, H/L, PD, PUD, PDTO, EZPEEL) SEA CAUGHT/ WILD CAUGHT SHRIMPS

Method of Distribution: **STORED & DISTRIBUTED IN REFRIGERATED CONTAINER BELOW -18^{0}C.**

Intended User: **GENERAL PUBLIC / RESTAURANT**
Intended Use: **TO BE THAWED & COOKED BEFORE CONSUMPTION**

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		
CCP-1 Raw material head on receiving stage	**<u>Sulphite</u>**	Absent	Residue of sulphite content.	. Do the sulphite analysis test.	. Each lot of raw material received.	Q.C Technologist	If it is positive, action will be taken against suppliers. Remove the supplier from approved list.	Sulphite test record.	Review sulphite analysis test report.
	<u>Biological</u> Growth of microbial pathogen	Temperature of raw material should be <4^{0}C	Temperature of raw material	By thermometer	Each lot of raw material received	Q .C Technologist	Reject the lot if raw material temperature is >4^{0}C	Raw material receiving register Bacteriological register. Thermometer calibration record	Review of the: Raw material temperature records. Bacteriological register Thermometer calibration record.

1	2	3	4					5	6
CP-2 Metal detection	Metal fragment	Fe: 1.5mm Non Fe: 2.0mm SS: 2.0mm	Metal fragments	Each block passing through metal detector	Continuously	Packing supervisor	The detected slab is removed and put in a locked box. The production manager /general manager unlock the box and defrost the slab. Divided in to 4 parts. Pass each individual piece through metal detector. If any individual detected, take the pieces cut with knife and analysis metal fragment. Then take out defected pieces. Before passed slab also take & recheck /pass through metal detector.	Metal detector records.	CCP-2 verification of metal detection Before starting the process pre operation checking has done with standard test pad then also periodically verification carried out every 30 minutes. Verification done once in a week.
CCP-3 (Packing material & Labeling)	Shrimps, ***botulinum toxin*** formation during finished product storage.	All finished product labeled with "containing shrimps" All finished product labeled with "Keep Frozen at below -18^{0}C"	Finished product labeling statement "contains Shrimp" & "Keep Frozen at or below -18^{0}C"	By visual	Label on each carton	Supervisor/ QA/ QC / Production In-charge/ Package executive/ Managing Director	Segregation of the lot at re- labeling	Label approval record	Review in once in a week

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(Managing Director)

XII. HACCP (CQP) Plan Form for Sea Caught/Wild Caught Shrimps (IQF)

1	2	3	4					5	6
Critical control Point	**Significant hazards**	**Critical limit**	**Monitoring**					**Records**	**verification**
			What	**How**	**Frequency**	**Who**	**Corrective action**		
CQP-1 Chemical treatment	Phosphate residue	Max. 5000 ppm	Phosphate residue testing.	Chemical analysis through strip method.	Daily source wise.	Q.C Technologist	If phosphate exceeds limit label on the master carton level of ppm	Soaking monitoring records.	Phosphate residual reports are verified by Q.A manager.
CQP-2 Final checking	Organoleptic	20%	Checking of defective pieces.	By online checking.	continuously	Q.C Technologist	Continuous training to improve skill.	pre-freezing inspection record (IQF)	Daily verification of pre freezing inspection record.
CQP-3 Freezing	Improper freezing	Min -18^{0}C	Temperature monitoring of frozen products.	Check freezing time and core temperature of product.	continuously	Production supervisor.	Segregate improperly frozen product & re-freeze.	Monitoring record for freezing IQF.	Daily verification of freezing monitoring record.
CQP-4 Glazing	Improper glaze	As per customer specification	Temperature of glaze water. On choke the nozzles, belt speed.	Controlling of time, temp., belt speed & cleaning of nozzles.	continuously	Production supervisor. Q.C Technologist	If glaze is less than required send product for re glazing.	Freezing monitoring and process control. (IQF line)	Daily verification of freezing monitoring & process

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1	2	3	4					5	6
									control records.
CQP-5 Weighing/ packing /labeling	Wrong labeling & packing	Nil	Labeling & packing operation.	by visual check of packing process	continuously	Production & packing supervisor	Check for any mislabeling, printing and correct it.	IQF packing record.	Daily verification of packing record.
CQP-6 Shipment	Temperature	-18^0C	Monitor loading temperature	Check temperature of container & cargo.	Every shipment	Cold store supervisor / Q.C technologist	Stop loading until the temperature is achieved.	Shipment details record.	Q.A to verify shipment detail record for each shipment.

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XIII. Predetermined Corrective /Preventive Action

A. When Antibiotic/Sulphite Residue (CCP-1) Exceed Critical Limit

d) ***Immediate corrective action:***

Identify affected lots through, source code and withdraw day code and withdraw all such lots from the processing floor as well as cold stores.

Tally the total withdrawn lots for quantity.

e) ***Preventive action:***

The supplier is traced back from the source –code and /or day code and removed from approved suppliers list to get rid of unworthy business alliance (his supplier declaration proves his untrustworthiness)

f) ***Corrective action records:***

CCP verification & corrective action reports for Antibiotic and sulphites.

B. When Metal Detection Exceed (CCP-2) Critical Limits

a) ***Immediate corrective action:***

The detected pouches /slabs are keeping as non-conformance in de marked cold store area.

b) ***Preventive action:***

The entire process line is traced and checked thoroughly for any possibility of loose metal, rust scrap etc. and any such situation upon notice is corrected.

c) ***Corrective action records:***

An NCR is raised and corrective action with regard to the same is reported back using the CCP verification and corrective action format for metal detector.

C. When Packing Material & Labeling (CCP-3) Critical Limits

a) ***Immediate corrective action:***

Segregate and return or destroy any label stock or pre- labels packing stock that does not contain the proper statement.

Determine and correct the cause of improper labels.

b) ***Preventive action:***

Finished products label for the presence of a “keep frozen” & “contains shrimps” statement.

Visual examination.

Representative number of package from each lot products.

Any person who has an understanding of the natural of controls.

c) ***Corrective action record:***

Record of labeling checks.

****

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17. Sampling Plan for the Establishment

Parameter	Frequency of Testing by EIA/USFDA/ BAP	IN HOUSE OR THIRD PARTY LAB	Testing method (Standard reference/ SOPs reference	Responsible person
water	Daily	IN HOUSE	Water quality checks for disinfection levels	Q.C. Technologist
	Fortnightly	IN HOUSE	As per EIC executive instructions Including coli forms	Q.C. Technologist
	Once in a six month	External lab	As per EU directive 98/83EC Including Microbiological & chemical parameters provided in Annex 6 of BAP standard	Q.C. Technologist
	Once in a Two Years	External Lab	As per EU directive 98/83EC	Q.C. Technologist
ICE	Fortnightly	IN HOUSE	As per EIC executive instruction Including BAP parameters	Q.C. Technologist
	Once in a six month	External lab	As per EU directive 98/83EC Including Microbiological parameters provided in Annex 6 of BAP standard	Q.C. Technologist
	Once in a Two Year	External Lab	As per EU directive 98/83EC	Q.C. Technologist
Raw Material	Each receiving lot	In-house lab	As per EU regulation &*microbiological pathogens and* aquaculture drugs listed in Annex 5, Table II provided in BAP Standard and / or as per buyers specifications	Q.C. Technologist
Finished products	Once in a two month	External Lab	As per EU regulation Pesticide :2002/63/EC Heavy Metal :2001/22/EC Veterinary drugs including banned drugs :2377/90 & its amendment and or as per buyers specifications	Q.C. Technologist
	Each lot, Each grade (composite)	In house lab	Bacteriological Tests as per EIC includes BAP requirements (5.15.3)as per Annex 5, Table II provided	Q.C. Technologist
	Each lot	External lab	As per exporting countries requirement/ As per Buyers requirement / As per EIC requirement	Q.C. Technologist
	1 sample each, each sample from 3 different lots	External Lab	Enhanced sampling (monthly) as suggested in BAP standard Annex 5, Table -1, Issue-4, revision-2, Dec 2015	Q.C. Technologist
Swab	Fortnightly	In-House lab	As per EIC executive instruction	Q.C. Technologist
Additives	Once in a six month	External Lab	For % of phosphate, Purity, Heavy metal	Q.C. Technologist
salt	Once in a six month	External Lab	Staphylococcus Aureus, Purity, Sulphite reducing clostridium, Heavy metal.	Q.C. Technologist
Chlorine	Receiving lot or each 10 days	In-house lab	Strength in of chlorine in hypochlorite solution	Q.C. Technologist

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	In each 2 hours	Chlorine paper test	Ppm of chlorine present in water	Q.C. Technologist
Sample retention	Q.C technologist is responsible for retaining frozen samples of 3 lots for each primary product form (see Annex 1 Glossary for the definition of "Primary Product Form") for every month they are in production. A sample is defined as a minimum of 4 ounces (113 grams). Samples shall be stored for one year from the time the lot is shipped. After one year the samples can be disposed of.			

The above testing parameters are as per the requirement of regulatory bodies,third party certification bodies viz. BAP, Buyers requirement which will suffice each other till the intent sampling & testing is met. The maximum tolerance limit for the different parameters are referred from the EIC executive instruction or BAP seafood processing standard issue 4, revision 2 Dec 2015 which is amended time to time as per the need of the industry or code of practice.

Corrective Action: When testing results are beyond the tolerance limit, the corrective action is taken as to eliminate the problem & preventive measure is also taken for the same to avoid in the future. If any raw material suppliers is detected for the antibiotic (sulphite, banned aquaculture drug, pesticides, growth promoting hormones) should be banned/disapproved from the approved supplier list and no material will be purchased from that suppliers and will be reported to be done to EIA/MPEDA for the further necessary action including suspension or cancellation of their registration.

Preventive Action: Preventive actions will be taken through PRPS, cGMPs, SSOP to minimize the risk of contamination at facility level. Also the RACSL facility is constructed in such a way that to minimize the potential risk of contamination. The color coding system is also in place to ensure that identification of different work zones. Training shall be given to all food handlers including supervisors, workers & managers for meeting the safety of the food produced.

****From the review of last six-month test reports performed by the external and internal labs for raw material and finished products results met the requirements of compliance for site standards includes BAP testing requirements. No complaint received from any buyers from last '6' months regarding quality and food safety aspects. Further from the lab was upgraded and equipped for performing in-house testing requirements as per the BAP standard and If in case of positive detected through In-house tests, the same lot is to be tested by the external lab by using HPLC MS- MS method for confirmation. Management has decided to conduct the In-house testing with inclusion of BAP requirements after the BAP certification audit.**

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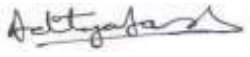

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18. Water Management System

The Prime source of water is from bore well at the backyard of the processing factory. The water passes through filtration systems for removal of Iron & the other one is Activated Carbon Filter built by Zeolite India Limited.

I. Methods of treatment

a) Water is drawn from the bore well & collected at the first filtration plant through spring basis, any content of Iron comes in contact with atmosphere Oxygen and forms ferrous oxide & sediments of Iron forms oxide gets collected in the filtration tanks. Filtrated water passes through four layers of gravel, Charcoal alternate and fine sands and passes through to the ground well through connected pipeline.

b) Water is now drawn into the water filtration system made by Zeolite India Limited for removal of any further traces of Iron. Suspended particles and other impurities also removed at this point through the process of sedimentation. This system comprises of a Soda pot, Alum pot and the main filtration chamber is sub-divided into 3 parts. They are Charcoal, Fine Sand and Catalytic Agent.

c) In the next stage when water passes into the sump, it gets mixed with liquid chlorine from an liquid chlorine doser situated nearby, making it upto 5 ppm level. The water is drawn to the overhead tank by a 5 hp motor from where it gets distributed to different sections of the processing plant.

d) Water used for processing and for manufacturing of ice, and passes through Ultraviolet rays to eliminate any traces of bacteria.

e) At the time of processing, the treated water in the processing hall once again checked for the chlorine level using chlorine testing kit by the on line Q.C.Technologists.

f) For proper functioning, the filters (both) are washed 2 times per day.

g) A separate filter washing register maintained & checked by Q.C. personnel on regular basis.

h) The Q.C.Department checks the quality of water in the laboratory in each 15 days and results are recorded in the separate register.

i) The media of each filter is changed every year or as per requirement by observing the test report.

j) Besides, the water is also analysed in a Govt. approved laboratory as per EU Directive by self.

k) All the lines used for water intake from ground water are Iron Pipes & all other lines are P.V.C.pipes.

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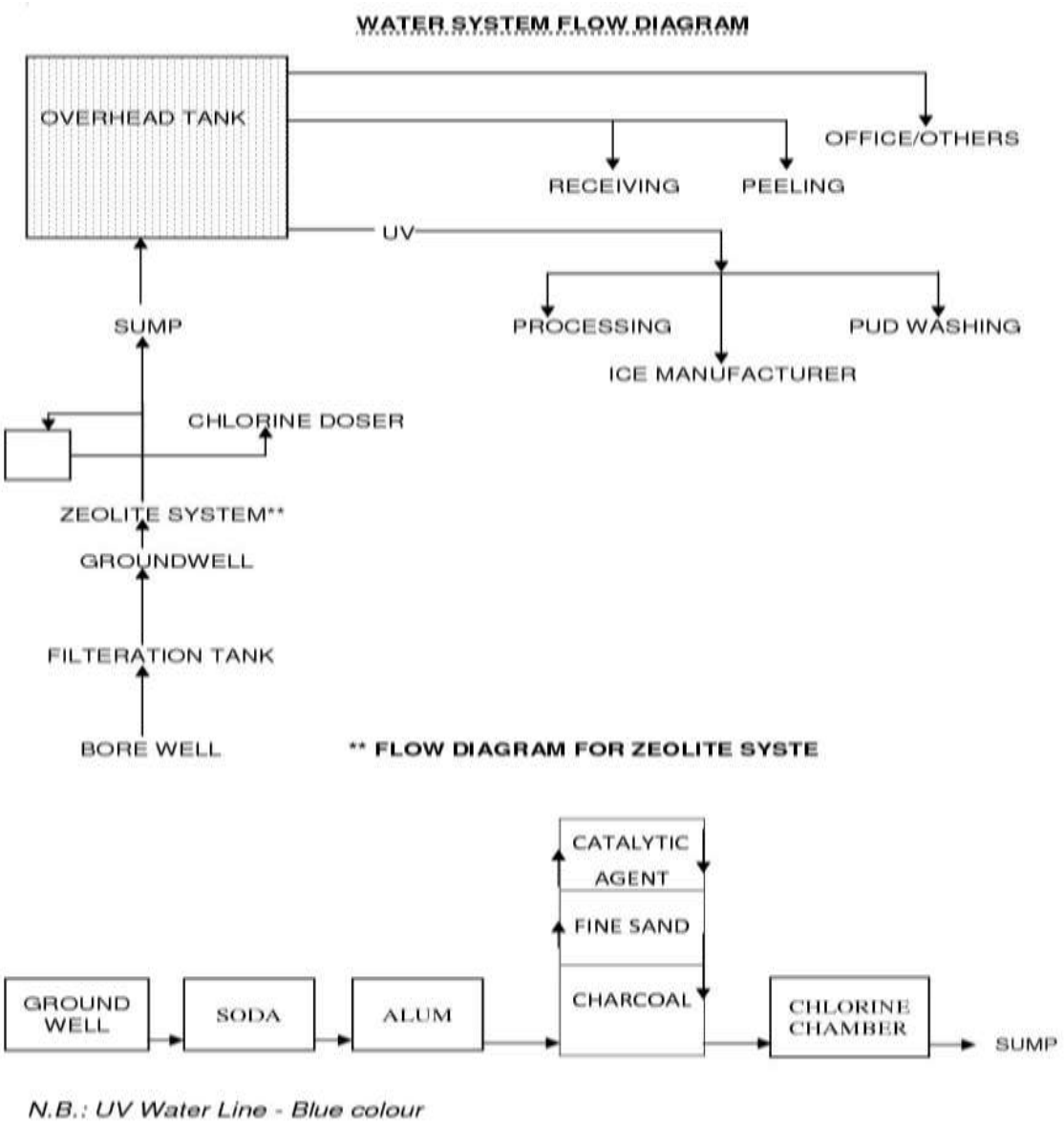
II. Water System Flow Diagram



N.B.: UV Water Line - Blue colour

III. Distribution & Identification of Taps

SL.NO.	TAP NOS.	NO.OF TAPS	LOCATION
PRE PROCESSING:			
1	01	1	Foot Dip
2	02, 03, 04, 05, 06, 07	6	Pre-processing (Ladies Change Room)
3	08, 09, 10	3	Wash Basin(Ladies Change Room)
4	11, 12, 13	3	Toilet(Gents Change Room)
5	14	1	Wash Basin(Gents Change Room)

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6	15, 16, 17, 18	4	Receiving Hall
7	19, 20, 21, 22, 23, 24, 25, 25, 26, 27, 28	10	Pre-processing Hall
8	29, 30	2	Wash Basin
PROCESSING:			
9	31, 32, 36, 37, 38, 39, 40, 41, 42, 43	10	Processing Hall
10	33	1	Flake Ice
11	34	1	Utensil Washing Room
12	35	1	Flake Ice
13	44, 45	2	Wash Basin
PROCESSING HALL:			
14	46	1	Foot dip (Processing hall entrance)
15	47, 48, 49	3	Toilet (Ladies Change Room)
16	50, 51, 52	3	Wash basin (Ladies Change Room)
17	53, 54, 55	3	Toilet (Gents Change Room)
18	56, 57, 58	3	Wash basin (Gents Change Room)
19	59, 60	2	outside
20	61, 62	2	Plant Room
21	63	1	Laundry
22	64	1	Doctors Room
23	65	1	Vehicle Washing
24	66, 67	2	Lawn
25	68	1	Kitchen
26	69, 70	2	Laboratory

Internal Testing

Water and ice are tested for total plate count, coliform in MPN Index including Vibrio Cholerae twice a month (fortnightly) by the technologist and observations recorded in laboratory analysis report.

External Testing

Water and Ice used in the unit is tested for portability in EIC approved Labs once in 2 year as per EU Directives 98/83EC and once in 6 months for 15 parameters, the reports of such testing are maintained and cross check by the report of Internal Certification. Besides, the EIA also draw one sample against each monitoring.

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19. Effluent Treatment Plant

I. Process

Water drained to the effluent treatment site from the main processing area undergoes the following stages of filtration, sedimentation and treatment in different chambers of the treatment plant.

Chamber No. 1, 2 & 3 (Filtration Tank): This chamber is provided with plastic nets of different mesh size to facilitate the filtration of the floating solid waste particle, thus preventing their entry into this sedimentation tank.

Chamber No.4, 5 (Sedimentation Tank): In this section there are two sedimentation tank located parallel with a inward slope to facilitate sedimentation of Heavier particles/objects. Here also the water is treated with required dose of lime and bleaching powder to facilitate easier sedimentation/coagulation and to kill traces of bacteria. From this chamber the drain line connecting to the next chamber is about 6 Ft above the base level of the tank. So when the water enters into this chamber from chamber no. 3 the heavier materials settles at the bottom of the tank without getting any chance to flow into the aeration tank.

Chamber No.6, 7(Aeration Tank): By the time the water enters into this chamber from the previous chamber through the connecting drain it is devoid of any type of floating particles and almost completely settled requiring sufficient aeration to facilitate the microbiological activity. Here we have provided two numbers of 2 HP Paddle Wheel Aerator for the same purpose running almost through out the day. Besides we also add a regular and required dose alum and lime to make the water suitable for growth of planktons in the next chamber.

Aerated Lagoon No.1,2,3: From the aeration tank the water is pumped into the aerated lagoon no.1 where it goes further aeration as well as sedimentation if required. From aerated lagoon no.1 the water flows into the aerated lagoon no.2 and again to aerated lagoon no.3 automatically by gravity. In all these 3 lagoons the water is constantly aerated by paddle wheel aerators.

Now the water is suitable for discharging to outside. However we use it for plantation purpose inside the factory premises.

The filtration and sedimentation tanks are cleaned in regular interval or as and when required. The water particles are sun dried in a pit nearby, and then it is carried to the Govt. dumping yards for waste disposal well away from the factory premises.

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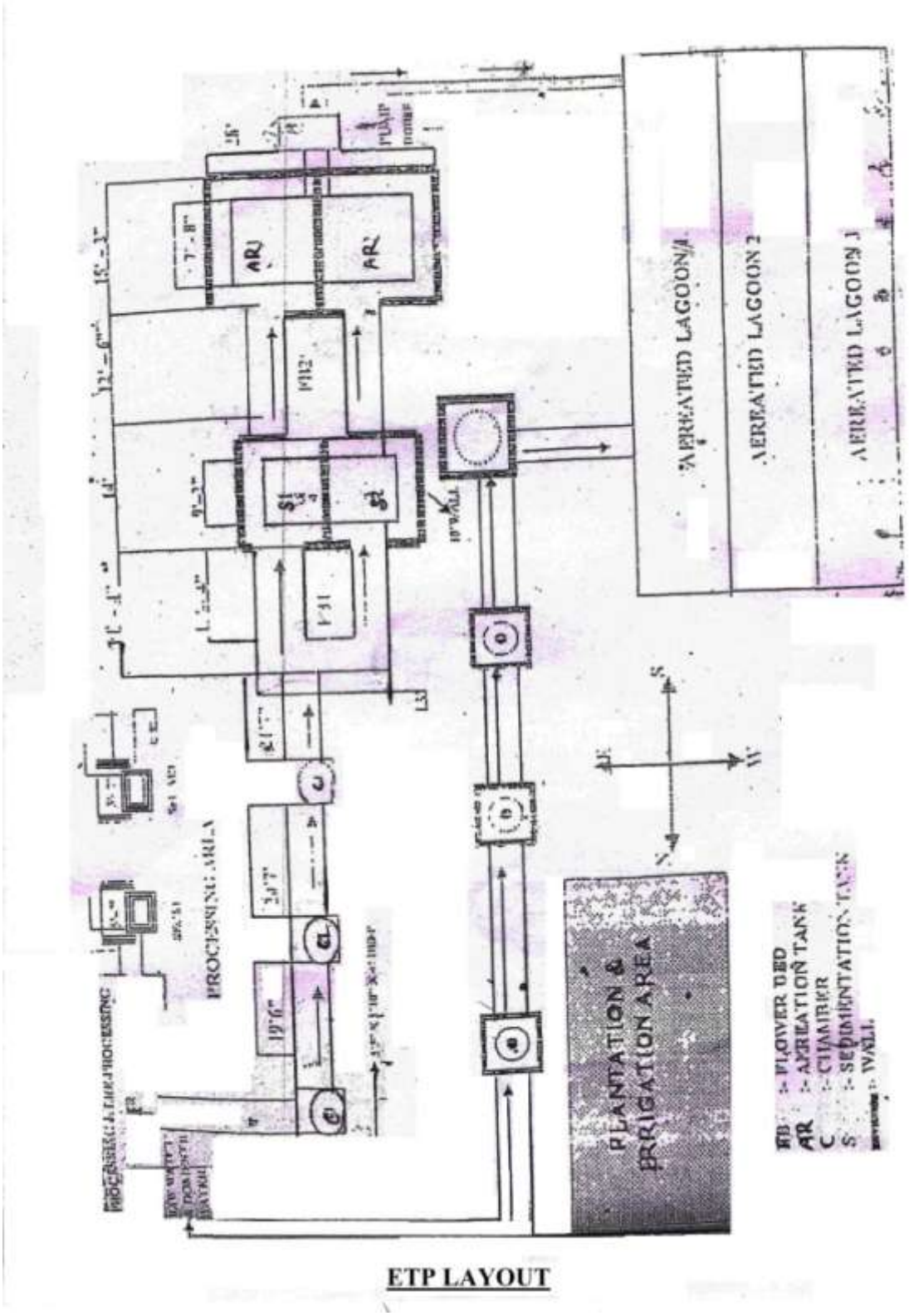
II. Effluent Treatment Plant Diagram



ETP LAYOUT

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20. Pest Control

I. Introduction

For prevention of pest, the company has made an agreement with an outside agency i.e. Innovative Pest Control, Bhimavaram. The Agency has provided trained persons with approved chemicals at factory site. The operation is carried out on daily basis starting from morning to evening covering the entire factory premises. The process of pest control comprises the following with a very effective manner.

a) Flies Control,
b) Mosquito Control,
c) Spider control,
d) Lizard and cockroach control,
e) Rodent control

Besides Fly catchers and air curtains are provided at various locations to reduce the risk from pest to nil level. For the same necessary records verified by the QC Technologist is kept in the laboratory.

A. Flies Control

The fly problem is a recurring problem which needs regular pest control service, flying insect control is difficult to achieve by conventional methods. Application of fog will kill most of the flies in a room, but it can't be used when employees are in the plant also it works only when the fog is in air. Flies are photo-tropic (i.e., get attracted to light). We use Pesto flash to control flies inside the plant.

Flier catcher and air curtain are provided at various locations to reduce the risk from the pest to nil level. As a precautionary measure we have also provided the Pest-o-Flash in different position inside the processing area which is mentioned below:

Pesto Flash no.	**Location**
PF-1	Receiving area
PF-2	Receiving area
PF-3	Pre-processing entrance
PF-4	Waste disposal chute
PF-5	Processing entrance

B. Mosquito control

This operation is taken targeting the different stages of the mosquitoes namely:

d) Larval stages:

These operations is carried out in all the breeding places in the plant premises and nearby area surrounding the property controlling all the aquatic and the larval stages by anti-larval operations weekly once.

e) Indoor residual spray:

Indoor residual spray is done in the property buildings monthly once.

f) Adult mosquito control:

Fogging operations is carried out in all offices and all residential quarters and external area building on an alternate day basis. This will also help to control the ingress of the insects from the neighboring areas.

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C. Spider control

Initially the cob-webs if any at the roof and wall junction and all the other surface areas in the entire factory are removed. After cleaning the wall junctions and other area by sanitation and hygiene workers, the pest control person sprays special insecticide formulation at all wall surfaces, walls junction and the entire roof. Necessary precautionary measures are taken to prevent the chemical spilling on material particularly in stores by covering it perfectly. This spray will control spider problem.

D. Lizard and cockroach control

Disinfestations is done with safe chemical in all resting-places like narrow cracks, crevices and pipes. All the surrounding areas and outside drains, man holes, toilets and office rooms are sprayed. This disinfestations will control the infestation of cockroaches and lizard.

E. Rodent control

For control of rodents at all major openings of the drainage system rodents traps are laid. Further there is only one outlet from the main processing area for drainage of waste water other drains from different sections are connected to the main drainage system (vide our drainage diagram). All the drains are covered with stainless steel plates. As a precaution measures we have also provided the Rodent traps during night time in different position inside the processing area which are mentioned below.

RODENT TRAP NO.	LOCATION
RT-1	Factory Main Entrance
RT-2	Receiving Platform
RT-3	Pre-processing Entrance
RT-4	Waste Disposal Chute
RT-5	Pre-processing main drain outlet
RT-6	Machine Room Entrance
RT-7	Packing Material Store
RT-8	Drain outlet near Vehicle washing
RT-9	Drain outlet near back side of ladies Hostel
RT-10	Entrance gate of back side quarter
RT-11	Entrance at IQF machine room

All rodents' traps and bat stations are provided with two types of bat in a week.

a. Sunday to Tuesday – Coconut
b. Wednesday to Saturday - Potato

In the next day morning all the traps are collected & checked. A separate register "Rodents Control" now maintained in Quality Control Department. Any rodent trapped is killed and the dead body disposed of or buried at a distant place.

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21. Traceability/Re-Call Procedures/Shelf Life Study

I. Traceability

Definition: *"A system of recall of product is a pre-requisite programmed (i.e. PRP) for any food processing operation because no process is fail safe. Traceability which includes lot identification by indicating either date of production or by giving batch or code for a lot of consignment is and essential to an effective recall programme"*

All products at the time of processing bears a code slip and which represents the following:

a) Processor Code
b) Type of product
c) Size-Grade
d) Date of Production
e) Best before end of 24 months
f) Traceability Code

The products at the time of packing in the master cartons also bear the following important data's on the both side of the Master cartons which are given under:

a) Processor code
b) Type of product
c) Size-Grade
d) Date of production
e) Traceability Code
f) Best before end of 24 months

Traceability is maintained everywhere starting from receiving to shipment, where the product can be traced back up to the name and address of the supplier.

a) The Director, Factory Manager along with production and quality assurance team will decide if a product recall has to be initiated, be it from a buyer's/importers complaint or from internal findings. Once it is decided to initiate a recall, the quantity of products, species and the variety of product to be recalled is identified.

b) To facilitate recall procedures Ram's Assorted Cold Storage Ltd. will identify the product right from raw material received, production, and lab analysis reports to shipment. This will be facilitated by the following.

- Product identification is done through number coding (batch numbers) on first -come and first-out basis a batch number consists of date, center, variety, total quantity etc.
- Codes are given on the slabs, inner cartons in case of blocks and on the poly bags and master cartons of IQF products.
- Production supervisor will maintain production records for a minimum period of two years.
- Traceability is written in every master carton that indicates the origin of the products.

c) Non-conforming products codes, date of production, type of packing and other relevant details will be communicated timely to the buyer asking him to with draw the product from the market/his cold stores and to destroy the product. The company will maintain records of all buyers/importers names, addresses, telephone numbers, fax numbers, e-mail address to communicate in emergencies.

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d) All records pertaining to Recall and destruction of the recalled product is kept in files. These will be made available to all regulatory authorities-national & international/buyers upon request.
e) All records pertaining to HACCP will be maintained for a minimum period of two years from the date of production/shipment.
f) Given training to the team on recall system through annual mock recall is conducted by management team to ensure the effectiveness' of the recall system. And also go through with the necessary adjustments or changes.
g) Notification shall be given to the customers as a part of mock recall or in the case of urgent recall, shall be requested to provide information's pertaining to the present status of the cargo as per the break-up at the earliest.

II. Classification of Product Recall

A product recall (Recall) is a voluntary action taken by Ram's Assorted Cold storage Ltd, Arakhakuda, Telengapentha, Cuttack or an action taken at the request of the FDA / EU or the buyer to remove from the market or to correct in the field, food products which are contaminated, adulterated, or misbranded and where the violation is more than a minor
in fraction and the product is subject to legal action by the FDA / EU or the importing countries government.

A Class I Recall
A class I Recall is an emergency situation in which there is a reasonable probability that the use of a volatile product will cause serious adverse health consequences or death ie: Botulinum toxin. In Class I recall, top priority will be given to the complete and immediate removal of the recalled product from every level in the distribution chain all the way to the consumer level.
A Class II Recall
A class II Recall is a priority situation in which a product deficiency may cause temporary or medically reversible adverse health consequences and where the probability of serious adverse health consequences is remote Eg. Salmonella enteritis. In a Class II Recall, product must ordinarily be removed from all levels in the distribution chain.
A Class III Recall:
A Class III Recall is a routine situation in which adverse health consequences of a product deficiency such as adulteration or misbranding are highly improbable or, non-existent Examples of Class III recall are situations involving improperly labeled products or products with filth contamination which contain dust or insect fragments. In a class III Recall, products must ordinarily be removed from the wholesale levels of the distribution chain.

III. Recall Process Procedures

Product Complaint Form/ File:
Ram's Assorted Cold storage Ltd, shall maintain complaint log and record all information

i. Initiation of recall/External Notification of Regulatory Agency:

Any food safety complaints that initiates the recall shall be notified to regulatory agency EIA (Export Inspection Agency) having all the information such as recall reasons, recalled product information total quantity of recalled product quantity distributed at the time of recall, quantity distribution of the recalled product if exported along with address, information on any other product which could be affected by the same hazard.

ii. Preparation of Public Notice:

Ram's Assorted Cold storage Ltd has taken accurate, timely communications with regulatory agencies and releasing recalled Information to public.

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iii. Confirmation Letter to Customers:

Ram's Assorted Cold Storage Ltd has providing confirmation letter to customers and provided with "URGENT-PRODUCT RECALL" form. During the event of any food safety complaints this format which was supplied before to our customers dually filled and sent back to us after providing the required information as per the content of the format attached.

iv. Product Recovery and Disposition:

Ram's Assorted Cold storage Ltd maintaining the records of supply to different customers are kept till product expiry. Upon receiving the recalled products, it is rechecked by the concern person for the percentage of recovery (shall be 95-100%) type of complaints made by the customers. If the complaints are correct the lot is segregated and kept separately in the non-conformance area with proper labeling.
After conducting a meeting with top management, the same lot is destroyed or reworked as per the outcome of the meeting. The total target time for the whole process takes 45 days -60 days. If it is a mock recall it shall take 6 hours and percentage of recovery fixed as more than 98%.

v. Termination of Recall:

All the corrective measures taken by the team for the disposition of the affected goods is satisfactory and all the data's of quantity recalled are matching then that recall procedure is complete.

IV. Product identification

- "Q" Mark with Approval Code No. - 370
- "Name and Address" of the processor and exporter – Ram's Assorted Cold Storage Ltd, Arakhakuda, At / Po -Telengapentha, Cuttack – 753051, Odisha, India.
- Production Code of the Product – Day code/Julian code/ Regulatory codes.
- Raw material supplying farmers are approved and they are identified by ID numbers and farmed registration no. along with pond no. which is also mentioned in the code slip,

Day code – Date, Month, Year.
Julian code – Day of the calendar year.
Regulatory code – Year, Month code, Date (Example – 2A01)

(i.e. alphabetic codes against each month is given below)

Month	Code*
January	- A
February	- B
March	- C
April	- D
May	- E
June	- F
July	- G
August	- H
September	- J

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October	- K
November	- L
December	- M

*Other customized codes are maintained as per buyer requirements.

- **Labeling:**

Contains production code/grade/variety/RM center code mark, center codes, farmer ID Numbers.

District	Code
Bhadrak	- BDK
Kendrapara	- KDP
Balasore	- BLS
East Godavari	- EG
West Godavari	- WG
Kakinada	- KKD
North 24 Parganas	- N24pgs
South 24 Parganas	- S24pgs

After shipment if there are any customer complaints HACCP team assembles and take decision as per the following procedures:

STEP TAKEN	**HOW**	**RECORDS**
Identifying the nature of complaints	The complaint will be classified into organoleptic, microbiological and chemical based on effective verification.	Customer's communication, if any.
Identification of the lot	The particular lot will be indentified through production codes and will be verified with the shipment tally book	Shipment details.
Traceability	For organoleptic complaints on-line QA check records will be verified,	For online QA check; i. Finished products inspection. ii. In- process product inspection. iii. Raw material QA check list.
	For microbiological complaints lab records will be verified.	For microbiology check; *i.* TPC, *Staphylococcus areus, E.Coli* *ii.* *Salmonella spp* *iii.* *Vibro cholera* iv. Sanitation samples for chemical check.
	For chemical complaints additive controls and supplier declaration will be verified.	i. Soaking register ii. Supplier declaration.

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Follow up action	If the complaints are genuine and the same are reflected in the re-call procedure findings. The managing Director initiates the necessary corrective action; and HACCP team assembled will verify the system and revise the critical limits and monitoring procedure sampling. Frequency (under the authentication of Director)

V. Recall Action Team

NAME	RESPONSIBILITY	CONTACT NUMBER
Aditya Dash	➢ Conveying customer complaints ➢ Interact with all buyers ➢ Final authority to decide on relevant issues.	Mobile No :+919937000186
Arun Das DIRECTOR	➢ Conveying customer complaints ➢ Coordinates with Factory ➢ manager ➢ Coordinates with all our buyers. -Price fixing of R.M	Mobile No: +91 9777049682 (O) Fax no
Sebastiean V.M MANAGER(Factory)	➢ Coordinating with all the ➢ departments to gather required Information. ➢ Mediates between regulatory authority, purchasers and factory ➢ Total production planning gathers information regarding packing and raw material arrival from factory and purchase manager coordinates with quality team and production supervisors.	Mobil no. +91 9937127430 Phone Numbers Fax No.
Sabir Sahajada QUALITY IN-CHARGE	➢ Verification of all kinds of records. ➢ Tracing the problem /defects in the product. ➢ Modification of the recall system. ➢ Getting all kinds of information regarding quality related matters from the ground level.	Mobile no: +91 9937013252 Phone Numbers

Records: - 1. Mock Recall - RACSL/SOP/
2. Corrective action of product report – RACSL/SOP/

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VI. Shelf-Life Study

- It is always advisable to cross-check the longevity of own products mentioned on the cartons/duplex (production / expiry date) considering how best the product suits for the time frame.
- This is a study where standard set temperature (-18 ^{O} centigrade) considered as constant i.e without any fluctuation. But there are some influencing factors which make temperature to fluctuate over a period of 2 years (ie the shelf -life set for most of the products)
- There are other factors such as poor handling of the product at different stages of the production which also influences the shelf of a product.
- Considering both factors in mind, a shelf-life study of different products are taken up.
- In this study a particular variety is tested organoleptically for every 6 months from the same lot. & the variations are noted in a file.
- Any considerable change which affect quality over a period of time shall be definitely considered for re-fixation of shelf-life frame..

Records :

1. Shelf-life study record

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22. CCP Monitoring

Definition

To conduct a planned sequence of observation or measurement of control parameters to access whether a CCP is under control and to produce an accurate record for further use in verification.

Purpose

To track the operation of the process and enable the identification of trends towards a critical limit that may trigger process adjustment, and to identify whether there is a loss of control at the Critical Control Point.

I. Process Step of CCP

A. CCP-1 raw material shrimps

Growth of pathogen: Growth of microbial pathogen.
Antibiotics: Presence of antibiotic reduces the resistance of immune system of human body.
Pesticides: presence of pesticides causes cancer in the lungs run in human body.
Sulphite: Presence of sulphite causes allergy to some consumer.
This the last stage at which the hazard can be control, hence this process step is Critical Control point (CCP).

B. CCP-2 Metal Detection

g) Metal fragment:

presence of metal causes physically injury to the consumer.
This the last stage at which the hazard can be control, hence this process step is Critical Control point (CCP).

h) Method/Activity

The method of monitoring is designed to provide rapid result so that critical limit failures are detected quickly and an appropriate corrective action instituted before the distribution of the product. The equipment/test kits chosen for monitoring at the CCP are ensured to be accurate through in house calibration. Personnel responsible for monitoring are trained in CCP monitoring techniques and the significance of the same.

Each batch of shrimps received by the unit is checked for residual sulphiting agents apart from other quality factors by the Q.C Technologist. Observation is recorded in the Raw Material receiving log. (Annexure-I).

i) Metal Detection Procedure:

- Metal detector is used for detecting metal fragments in the finished frozen product.
- Sensitivity of metal detector is set for 2.0 mm ferrous, 2.5mm non-ferrous & 3 mm stainless steel metals.
- Frozen bags/slabs are passed through metal detector through the conveyor.
- Metal detector is checked before operation every day.
- It is checked for every one hour during operation.
- Metal detector is checked at the end of operations every day
- Record the time, variety, number of slabs passed, etc in metal detector log. (RACSL/SOP/)
- Hold and evaluate product in which metal fragments are found.
- Corrective action shall be taken if metal detector fails.

j) Corrective action procedures:

1. The following corrective actions shall be taken when metal fragments found in frozen slabs/bags

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- If metal detected during the process, detector gives alarm and belt gets stopped automatically. Such slabs/bags shall be rechecked once again through metal detector.
- If found detected again, such slabs/bags shall be thawed& inspected for metal fragments.

1. Take one of the following actions when product is not passed through metal detector;
   - If metal detector fails during production, such slabs/bags shall be isolated in the cold store with clear marking of the area and taken back for passing through metal detector only after repair as per the above procedure.

k) Preventive action measures:

Once in four months plant engineers shall do maintenance work.
Responsibility: Packing supervisor, QA personnel & Plant manager.

l) Records:

Metal detector record

C. CCP-3 Labeling:

Shrimps: Shrimps are listed as one of the major allergen in USFDA list. It may causes allergic to some consumer. So declaration on packaging material is mandatory to aware allergic consumer. This is the last stage at which hazards can be controlled, hence this steps is Critical Control Point (CCP)

Clostridium botulinum: toxic formation during finished product storage which leads to symptoms like weakness, vertigo, swallowing and frequently abdominal swelling, consumption, paralysis & death. So there is also declaration in the packaging step that the product is ready to cook .At high temperature c. botulinum eliminated from the products. Hence this is the last stage at which hazards can be controlled, hence this steps is Critical Control Point. (CCP)

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23. Verification Procedure

I. Definition

To activity, other than monitoring, that determine the validity of the HACCP plan and that verify the system is working according to the plan

II. Description of Verification Activities

Verification should be undertaken by an appropriately qualified individual who are capable of detecting deficiency in the plan or its implementation. Verification should be undertaken at the completion of the HACCP Study, whenever there is a change in product, ingredients, process, etc., in the event of newly identified hazards, and at regular pre-determine intervals.
Routine monitoring activities for critical limits should not be confused with verification methods, procedures or activities.
The company follows verification activities to access that the HACCP plan is adequate to control the hazards associated with the product and is being followed.

III. Validation

The company has ensured that all elements of the plan have a scientific basis and represent a valid approach to control the food safety hazard associated with the process and the product. Initial validation of the plan has been done on scientific data vide codex alimentarius guideline and the guidance of the Competent Authority and other regulatory agencies. Apart from that the company has the policy to perform validation whenever changes in raw materials, finished product/process, and recurring deviations are found.

IV. CCP Verification

i) **Calibration:** All the devices used for monitoring are, calibrated to verify that monitoring results are accurate. Dial and MIG thermometers, thermograph is calibrated monthly against standard thermometer recorded in the calibration log (Annexure-XVI)
ii) **Calibration record review:** Records of calibration are reviewed to check the dates, method of calibration and the test result.

iii) Targeted sampling and testing: Verification of sulphite residual control/ Histamine control at the receiving step is done quarterly in the laboratory to ensure that the results obtained through the original monitoring procedure are accurate.

iv) CCP records review: Both the records generated at the CCP, monitoring and corrective actions are reviewed to verify that CCPs are operating within safety norms and that deviation are taken care of in a safe manner.

V. HACCP System Audit

As part of verification audits are performed to compare the actual practices and procedures of the HACCP system with those written in the HACCP Plan.
Audits are systematic and independent examinations involving on-site observations, interviews and review of records to determine whether the procedures and activities stated in HACCP plan are implemented in the HACCP system. These examinations are usually performed by one or more independent persons who are not involved in implementation of HACCP system.

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The HACCP System is reviewed both through on-site verification as well as a schedule system wide verification. The online verification activities include in process inspection, raw material testing (organoleptic & bacteriological) and product testing (organoleptic & bacteriological) and equipment evaluation report (maintenance records).

For the system vide verification, Export Inspection Agency (Govt. of India) competent authority regularly monitors the unit for compliance of the adopted HACCP system. Deviation if any are pointed out, are suitable rectified. The company has the policy of appointing an external auditor of food processing background to undertake a complete audit and review on an annual basis or when there is an occurrence of system failure or a significant change in product and/or process line.

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24. Training

I. Training Objective:

The objective is to examine the importance of the training of those engaged in food business operations who come directly or indirectly into contact with food to a level appropriate to the operations they are to perform. Inadequate hygiene training, and/or instruction and supervision of all people involved in food related activities pose a potential threat to the safety of food and its suitability for consumption.

II. Awareness and Responsibilities

Food hygiene training is fundamentally important. All personnel should be aware of their role and responsibility in protecting food from contamination or deterioration. Food handlers should have the necessary knowledge and skills to enable them to handle food hygienically. Those who handle strong cleaning chemicals or other potentially hazardous chemicals should be instructed in safe handling techniques. In our processing unit we have arrange in-house training once in a month by qualified, experienced personnel‟s and externally training organized by EIA/MPEDA and the training details are maintained in the *Training Record (Annexure-XXXVIII)*

III. Training Programme

A. Procedure:

- As per schedule, training programme is conducted for all the employees.
- Training is given to all the workers based on their working area/location through their mother tongue.
- The HACCP team shall give training section-wise as per schedule.
- The QA Team shall organize training as per the agenda in the day time only.
- All the employees are trained on company's management policy & on pre-requisite aspects of perishable goods.
- Whenever competent authorities conduct any technical related programme, we make our staff available to attend. Supervisors and housekeeping staff are trained regarding high level of compliancy to achieve clean and safe food.
- Effectiveness Induction training shall be given to the new employees and also, job training in their respective sections before being given individual responsibility.
- Fresher (s) shall be trained on company quality policy and general guide-lines like entry, hand washing, discipline etc.
- The next level training topic includes time-temperature abuse in perishable goods, sanitation and hygiene in work place (both Plant and personnel) ,safe operation of equipments, safe handling of products ,first-aid firefighting, pest control security, recall programmes, company's management policy, etc.
- Efficiency of the training is cross-checked by the following procedure:
- Trained employees shall be selected randomly.
- The trainer who has not conducted the training class shall analyze the effectiveness of training.
- Questionnaire shall be given to recently trained employees on the related training topics
- Analyze the same based on the no. of correct answers.
- As per the assessment, an additional training shall be given.
- Record the efficiency of training programme.
- Training methods and content will be reviewed once in a year.

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B. Training Calendar of Activities

MONTH	TRAINING	PARTICIPANTS	TRAINER	METHODS
JAN.	Food Safety & Induction Training	Supervisors workers of RM/PPC/PRC /Hygiene Team, machinery, laboratory.	Production & Quality Assurance in charge	Oral with relevant Documents
FEB	House keeping	supervisors	QA in charge	Oral with relevant documents
MAR	Product Recall Training	supervisor	QA in charge & Export Manager	oral
APR	SOP & SSOP Training	Supervisors workers of RM/PPC/PRC /Hygiene Team, machinery, laboratory	QA Personnel	Oral with relevant Documents
MAY	Hygiene & Sanitation and Personnel hygiene	Supervisors workers of RM/PPC/PRC /Hygiene Team, machinery, laboratory	QA Personnel	Oral with relevant Documents
JUN	Incident Management	Supervisors ,workers of RM/PPC/PRC/Hygiene Team, machinery laboratory.	General manager, Production & Quality Assurance in charge	Oral with relevant Documents
AUG	Security System	Supervisors, workers of RM/PPC/PRC, Hygiene team machinery ,office Staff, laboratory staff	General manager, Production ,Quality Assurance in charge & Security Incharge	Oral with relevant Documents
SEP	Allergens & HACCP	supervisors	QA Personnel	Oral
OCT	Induction Training	Supervisors ,workers of RM/PPC/PRC Hygiene team, machinery, Laboratory staff.	QA Personnel	Oral with relevant Documents

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NOV	CCP	Supervisors ,workers of RM/PPC/PRC Hygiene team, machinery, Laboratory staff.	General Manager, Production Manager Q.A manager.	Oral with relevant Procedures
DEC	GMP	Supervisors ,workers of RM/PPC/PRC Hygiene team, machinery, Laboratory staff.	Production in charge & QA in charge	Oral

Subjects of training topics

1. Importance of personnel hygiene, HACCP, Quality policy, objectives
2. Importance of product/personnel prevention of cross contamination, CCP monitoring of crates/nets/tubs etc.
3. Usage of sanitizers/food &non-food grade chemicals.
4. Handling of shell waste/used gloves/packing materials etc.
5. Material washing of food contact and non food contact surfaces
6. Washing washing/bubble tank washing etc, extraneous physical hazard handling.
7. Proper usage of trolleys/chutes/change rooms/toilets/cupboards etc.
8. Safe handling of the product. **food safety management**
9. IQF machine cleaning
10. Handling of high risk product
11. pan sanitizing/labeling/setting/importance of glaze water
12. packing and labeling of duplex/pouches/cartons
13. Handling of packing material
14. Stacking of finished product in cold store
15. container loading/ non-conformed product/area
16. Safety or security measures in cold store, water ,ingredient, personnel, storage ,food ,shipment
17. emergency safety measures
18. loading
19. Time-temperature abuse
20. Good Manufacturing of Products.

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25. Buyers Complaint Procedures

E-mail/Fax communicates problems pertaining to particular cargo to us from the buyers. On receipt of the complain, it's initially studied by the Export Department. A copy of the same complains send to the factory production and quality control department.

The quality control personnel take up the matter with the production people and ascertain the origin of the problem.

When the problem is supposed to have occurred the supervisors beckoned and apprised of the situation and advised to take necessary care to eliminate such problems.

The complaint also circulated among other concerned production supervisors to take adequate measures to prevent repartition of such problems. The complaint registered and filed with Q.C. Department. Before the next consignment dispatched we call for "Quality Check" Inspectors in addition to our house quality checks. Sometimes buyer's Q.C personnel also take their own inspection at our plant.

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26. Policies

I. Glass /Plastic Policy

1. The lay out will indicate the glass and hard plastic presence and its location which are serially numbered. Fittings of glass in partitions, ventilator, doors, etc. at reachable height in the operating areas with glass and hard plastic fittings are serially numbered.
2. The Q.C will conduct daily survey for the entire premises to check the intactness of the glass, hard plastic, ceramic tails and sinks. If broken the root cause analyzed and corrective action will be taken by replacing the same within the shortest possible time.
3. Product in case contaminated with breakage incidents glass and hard plastic will be thoroughly checked for glass and hard plastic pieces are recovered. If the product is contaminated with inseparable glass pieces such product will be discarded completely.

Records
Daily HACCP Maintenance

II. Metal Policy

As a principle of seafood Industries, utmost care is taken to keep the product free from metal contamination in order to supply the product to the consumer without contamination with metal fragments by any chance.
RESPONSIBILITY: Q.C and operator.
PROCEDURE: Metal fragments could enter the process from the following sources as a result of damage or broken equipment.
1. Blades and scissor at the time of value addition and packing.
2. Metal fragments detached/broken out of machinery equipments and process table.
A. The metal contamination is controlled by visual inspection during process
B. By passing the finishing product through metal detector
C. At value addition Blades and scissor controlled by number of issued pieces tally with collected ones at the end of the shift.
RECORD-
1. Metal detector record
2. On-line Inspection Report

III. Jewelry Policy

- The sign board will indicate the jewelry policy in each section before
- Jewelry includes watches, fingure rings, bracelets, necklaces, body Piercings and facial jewelry.
- Jewelry at work is a major safety hazard and can cause serious injuries.
- Jewelry can get caught in power tools or stuck against objects, conveyors and moving parts of machinery.
- Remove all Jewelry and store it or do not bring it to work.
- The H&S supervisor and Q.C Technologist daily monitoring before each shift.

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27. APPENDIX

I. APDX-I: Amendment sheet for HACCP manual

Serial No	Date of Amendment	Document name	Page No	Nature of change	Authority
1	01.03.2015	HACCP/005/01	1	Declaration	MR
2.	01.03.2015	HACCP/005/01	2	Quality Policy	MR
3.	01.03.2015	HACCP/005/01	3	Quality Objective	MR
4.	01.03.2015	HACCP/005/01	4	Company profile	MR
5.	01.03.2015	HACCP/005/01	10	Organisation Chart	MR
6.	01.03.2015	HACCP/005/01	11 &12	HACCP Team Responsibility	MR
7.	01.03.2015	HACCP/005/01	29	Risk Analysis	MR
8.	01.03.2015	HACCP/005/01	30	Hazard analysis work sheet for water & ice	MR
9.	01.03.2015	HACCP/005/01	31	Hazard analysis work sheet for additives	MR
10.	01.03.2015	HACCP/005/01	32	Hazard analysis work sheet for packing material	MR
11.	01.03.2015	HACCP/005/01	33	Product profile	MR
12.	01.03.2015	HACCP/005/01	38,39,96,97,98	On site verification process flow for block frozen(Aquaculture/Sea caught/Wild caught)	MR
13.	01.03.2015	HACCP/005/01	67,68,126,127	On site verification process flow for IQF(Aquaculture/Sea caught/Wild caught)	MR
14.	01.03.2015	HACCP/005/01	50-55,79-84	CCP Decision Tree(Aquaculture)	MR
15.	01.03.2015	HACCP/005/01	109-114, 139-144	CCP Decision Tree(sea caught / wild caught)	MR

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16.	01.03.2015	HACCP/005/01	56-57,115-116	Justification of CCP (Block)	MR
17.	01.03.2015	HACCP/005/01	85-86,145-146	Justification of CCP (IQF)	MR
18.	01.03.2015	HACCP/005/01	58,117	Justification of CQP(Block)	MR
19.	01.03.2015	HACCP/005/01	87,147	Justification of CQP(IQF)	MR
20.	01.03.2015	HACCP/005/01	59-61	HACCP plan form for Aquaculture shrimps (Block)	MR
21.	01.03.2015	HACCP/005/01	88-90	HACCP plan form for Aquaculture shrimps (IQF)	MR
22.	01.03.2015	HACCP/005/01	118-120	HACCP plan form for Sea caught/ wild caught shrimps (Block)	MR
23.	01.03.2015	HACCP/005/01	148-150	HACCP plan form for Sea caught / Wild Caught shrimps (Block)	MR
24.	01.03.2015	HACCP/005/01	62,91,121,151	Pre determined corrective / Preventive action	MR
25.	01.03.2015	HACCP/005/01	152	Sampling plan for the Establishment	MR
26.	01.03.2015	HACCP/005/01	163-166	Pest Control	MR
27.	01.03.2015	HACCP/005/01	168-174	Traceability	MR
28.	01.03.2015	HACCP/005/01	175	Shelf Life Study	MR
29	01.03.2015	HACCP/005/01	177-178	CCP Monitoring	MR
30	01.03.2015	HACCP/005/01	183-185	Training	MR
31.	01.03.2015	HACCP/005/01	190	Jewellery Policy	MR
32.	08.05.2015	HACCP/005/01	06	Food safety objective	MR
33.	08.05.2015	HACCP/005/01	28,67,96,125	Temperature for Flow Chart for both Aquaculture & Sea	MR

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				caught	
34.	08.05.2015	HACCP/005/01	174	Recall Action Team	MR

II. APDX-II: List of Registers/Documents

1.	Annexure-I	:	Raw material receiving log
2.	Annexure-II	:	Sulphite Test report
3.	Annexure-III	:	Register for processing
4.	Annexure-IV	:	Consolidated daily production register
5.	Annexure-V	:	Packing Register
6.	Annexure-VI	:	Washing & Cleaning Schedule (Pre-processing & Processing)
7.	Annexure-VII	:	Chlorine registers (Pre-processing & Processing)
8.	Annexure-VIII	:	Daily sanitation report for processing
9.	Annexure-IX	:	Personnel hygienic report
10.	Annexure-X	:	Chemical Register
11.	Annexure-XI	:	Cleanliness of equipments/utensils
12.	Annexure-XII	:	Overhead tank cleaning register
13.	Annexure-XIII	:	Insect catcher control
14.	Annexure-XIV	:	Rodent control
15.	Annexure-XV	:	Freezer log book
16.	Annexure-XVI	:	Calibration log for laboratory & plant machinery equipment register
17.	Annexure-XVII	:	Health Card
18.	Annexure-XVIII	:	Identification of V.Parahymolyticus Register
19.	Annexure-XIX	:	Register for Bacteriological analysis
20.	Annexure-XX	:	Identification of Salmonella
21.	Annexure-XXI	:	Identification of V.Cholera
22.	Annexure-XXII	:	Register for assessing Sanitary Standards of the unit
23.	Annexure-XXIII	:	Register for analytical report
24.	Annexure-XXIV	:	Daily filter washing register
25.	Annexure-XXV	:	Raw material inspection registers
26.	Annexure-XXVI	:	Cleaning & control of drains
27.	Annexure-XXVII	:	Control of Air-Curtains
28.	Annexure-XXVIII	:	Offal Disposal and waste bin maintenance
29.	Annexure-XXIX	:	Cleaning of floor, ceiling and walls
30.	Annexure-XXX	:	Apron and Dress cleaning (Laundry Log)
31.	Annexure-XXXI	:	Daily Vehicle Washing Register
32.	Annexure-XXXII	:	Laboratory Equipment Register
33.	Annexure-XXXIII	:	Packing Material Stock Register
34.	Annexure-XXXIV	:	Chemical Stock Register
35.	Annexure-XXXV	:	Thermograph Register
36.	Annexure-XXXVI	:	Laboratory Media and Reagent Register
37.	Annexure-XXXVII	:	Time Temperature Control Register
38.	Annexure-XXXVIII	:	Training Record
39.	Annexure-XXXIX	:	Plant and Machinery maintenance Register
40.	Annexure-XXXX	:	IQF Packing Register

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III.

APDX-III Receiving Material Specifications

[redacted]Procedure

The raw materials are selected on criteria framed by Ram's Assorted Cold Storage Limited. Such criteria are based on standards for receiving the material, processing, packing and microanalysis.

Raw material: Raw materials are received only when it does not exceed the following organoleptic limits.

Characteristics	Limits
Temperature	Less than 4°C
Appearance	Natural colour with good freshness
Odour	Natural Characteristic, Fresh odor
Texture	Soft & firm, slightly tough
Dehydration	5%
Discoloration	5 %
Deterioration	Nil
Black spot /tail	5 %
Loose shells	6 %
Broken& damaged pieces	5 %
Back broken	5%
Material with fungus	10 %
Drooping head (H/ON)	15 %
Objectionable foreign matter	Nil
Tolerance Sulphite residue	Nil
Antibiotic residue (Chloramphenicol)	0.5 ppb (detectable limit)
Nitrofurans (AOZ, AMOZ, SEM & AHD)	1.0 ppb (detectable limit)
Muddy smell	Absent

[redacted]Food Grade Chemicals

Chlorine (santizer)

Chemical	**sodium hypo chlorite**
Colour	yellow.
Concentration	5-10%
Odour	characteristic pungent smell

Salt

Salt used is of recognized brand and is food grade	
Appearance	white powder
Purity	Not less than 95%
Filth	No tolerance limit.

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Sodium phosphate

Sodium phosphate (carnal) used shall be of a recognized brand and of foodgrade.

Appearance	**white powder**
Filth	No tolerance limit
P2 O5	60%
Na2 O	42%
PH	10
Arsenic	1 ppm
Lead	1 ppm
Cadmium	1 ppm
Mercury	1 ppm
Heavy metals (as Pb)	10 ppm
Fluoride	3 ppm

Non Food Grade Chemical

Detergents soap:

Colour	**light yellow.**
Purity	90%
PH	7.5 – 9.0

Receiving Material Specifications

m) Packing material:

The packing material includes all kind of, duplex cartons, master cartons, polythene sheets and bags.

n) Duplex cartons:

Parameters	**Limits**
Material	Duplex board
Style of duplex carton	One-piece staple less, laminated or wax coated with
	Both sides closing system using folds.
Substance	300 gm/m minimum
Bursting strength	4 kg/gm/m minimum
Printing detail	i. Brand name
	ii. Type of product
	iii. Weight of the product
	iv. Grade/variety/code markings
	v. Name of the processors
	vi. Country of origin

o) Master carton:

Characteristics	**Limits**
Material	E- Flute corrugated fiber board (5 ply cartons)
Style of carton	Preferably one-piece staple less or buyer needs
Substance	Both liners & fluting 120 gm /m 2 minimum
Bursting strength	9.5kg /cm minimum
Printing details	As above

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Quality mark and approval number are as per buyer specification Storage specifications

p) Polyethylene sheets and Bags:

Characteristics	Sheet	Bags
	Limits	
Low density polyethylene	50 - 200 gauge ± 10%	100-400 gauge ± 10 %
High density polyethylene	50 - 200 gauge ± 10 %	100-400 gauge ± 10 %

Finished Product Specifications

q) Procedure:

- The finished product is packed as per authorized specifications and buyer requirements.
- The finished product is specified with type of freezing i.e. block, IQF production code, brand name, packing style, species (common, scientific), buyer name (if necessary)
- Finished product temperature shall be below -18^0C.
- Ram's Assorted Cold Storage Limited is not involved in design and development of any product and all formulations, specifications shall be given by the buyer.

The characteristics of finished product shall be as follows:

i. Organoleptic standard of frozen products:

Factor	Maximum Tolerance Limit
Net weight	As per buyer's specification
Thawed count/LB or KG	As per buyer's specification
	or Weight per piece
Dehydration	Slight <20% by weight severe<0%
Discoloration of shell/meat	20% for shrimps 10% for all other products
Deterioration	5% for countries other than USA 0% for USA
Decomposition	0 tolerance (severe or mild)
Black spot on shell	10% (mild) by weight for HL/HO products 5% (mild) by weight for peeled products, severe 0%
Malenosis on meat	0 tolerance (severe or mild)
Broken & Damage pieces	<5% (less than 4 segments taken as Broken)
Legs, Veins, Antenna	10%
Soft shell & Hanging meats	<15% by weight (Soft shell) & <5% by weight (Hanging meat)
Objection Foreign matter	NIL
Uniformity of size	U7-31/35= 1.35; 36/40-41/50= 1.4; 51/60-61/70= 1.5; 71/90-91/110= 1.6; 110/130= 1.7
Texture	Slight toughness for HL
	Moderate Toughness for peeled products
Odour	Salty, slightly sweet typical shrimp flavor Typical shrimp aroma: briny, ocean-like. No decomposition odors such as sour, ammonia, fecal, putrid or rancid.
Weight	Declared weight
Grade	Counts should be within the limit

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ii. Bacteriological standard of frozen products:

TPC at 37^{0}C	**5, 00,000/gms (maximum)**
E. coli at 37^{0}C	20/gm (maximum)
Staphylococcus at 37^{0}C	100/gm (maximum)
Salmonella	Absent
V. cholerae	Absent
V. parahaemolyticus	Absent

iii. Water & ice

Total plate count at 37°C	**20 cfu / ml**
at 22°C	100 cfu / ml
Coli forms	Absent/100 ml
E. coli	Absent/100 ml
Clostridium perfringens (including spores)	Absent/100 ml
Pseudomonas aeruginosa	Absent/250 ml

iv. Antibiotic Standards (Detectable Limit):

Chloramphenicol	**0.5 ppb**
Nitrofurans (AOZ, AMOZ, SEM & AHD)	1.0 ppb

IV. APDX-IV: General processing steps and control points

Receiving:

After receiving raw material at the receiving area of the unit through insulated vehicles detail analysis to be carried out for the following factors.

a) Material Temperature and Icing Condition
b) Decomposition
c) Any type of Additives.
d) Microbial Pathogens.
e) Filth and Foreign matter etc.
f) Other Organoleptic Factors.
g) Supplier's Guarantee Certificate
h) Sulphite Test

The following preventive measures to be taken in receiving area.

a) Clean and sanitize the surroundings.
b) To check the functional facilities such as foot dip, hand wash and chlorine dip.
c) Check the effectiveness of air curtain/fly-proofing/pest and vermin control.
d) Check the plumbing route/taps/hoses etc. for cleanliness.

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e) Clean and sanitize floors, walls, utensils, weighing machines etc. with required level of chlorinated water before and after each operation.
f) Maintain high degree of personnel cleanliness.
g) Receive fresh shrimps only without any type of colour additives.
h) Check Quality and adequacy of ice and temp. of raw material at temperature <4oC
i) Weigh the material accurately.
j) Wash thoroughly with 2 ppm chlorinated water to remove all traces of dirt and filth.
k) Check the organoleptical Quality of the material with a sampling scale of 1 sample(1 Kg) per 500 Kgs.
l) Avoid delay.
m) Draw the samples for bacteriological test and send it to the Laboratory.
n) Dispose of all the waste at frequent intervals.
o) Doing Sulphite Test

Pre-Processing Stage:

a) Checks should be done for the following: -
b) Temperature abuse
c) Microbial Contamination
d) Foreign Material
e) Filth
f) In sanitary equipments, container, tables etc.

Preventive Measures to be taken: -

a) Check the cleanliness of change room.
b) Check the effectiveness of air curtain/fly proofing, pest and vermin control.
c) Check the cleanliness of plumbing route/taps & hoses.
d) Wash clean and sanitize floor, all types of utensils, tables, equipments etc. with required level of chlorinated water before starting and after completion of work.
e) Transfer the Peeled/Be-headed material properly iced to processing section after washing with potable water.

Processing Stage:

Possible Hazards: -
Physical Hazards i.e. Foreign Particles, Glass pieces, metal fragments, wood splinters, stone etc…
Bacterial Hazards i.e.

a) E.Coli
b) Staphyllococous
c) Streptococous
d) Salmonella
e) V.C.
f) V.P.

Chemical Hazards i.e.

a) Pesticides, Heavy Metals, Antibiotics
b) Sulphites

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c) Excess Chlorine
d) Phosphates(if required as per Buyer's requirement)

Economical Hazards i.e.

a) Improper grading
b) Short weight
c) Improper Marking on Carton etc.

General Preventive Measures: -

a) Check the effectiveness of fly-proofing, pest and vermin control.
b) Check the cleanliness of plumbing route/taps & hoses.
c) Check the Cleanliness of change room/rest room.
d) Check the cleanliness of foot dip, hand wash and chlorine dip.
e) Maintain high degree of personnel cleanliness.
f) Wash, clean and sanitize all types of utensils, tables floor equipments etc. with required level of chlorinated water before starting and after completion of work.
g) Grade the material according to size and re-check grading accuracy.
h) Store the remaining excess material in chill room or with adequate ice.
i) Ice the graded material properly till take up for packing.
j) Use adequate ice made from 2 ppm chlorinated potable water.
k) Handle the materials carefully.
l) Maintain high degree of personnel hygiene and cleanliness.
m) Clean the table properly after grading.
n) Remove all waste at frequent interval.
o) Wash the graded material with 2 ppm chlorinated water.
p) Transfer the graded material to the packing table and allow to drain water completely.
q) Weigh the material correctly.
r) Weighing scales to be calibrated once in a year by Weight & Measurement Dept. of Govt. of India.
s) Dip the polythene sheets in chlorinated water.
t) Mark the duplex cartons and code slips correctly.
u) Place the code slips at correct position.
v) Arrange the shrimps properly in rows.
w) Pour chilled chlorinated glaze water.
x) Fill the Duplex inner carton in trays.
y) Check the physical and organoleptic factors.
z) Draw samples for bact. analysis.
aa) Avoid Delay.
bb) Check the temp. gauge and pressure gauge of fresher.
cc) Arrange trays in pre-cooled freezer.
dd) Freeze the temp. at -40 degree C.
ee) Unload the freezer after freezing is completed within 120 Minutes.
ff) Check the hardness of slab and core temp. of slabs(-18^{0}C).
gg) Transfer the slabs to packing section without delay.
hh) Clean and sanitize the freezer after each load.

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4. Packing and Storing Stage:

Possible Hazards:

a) Temp abuse.
b) Filth.
c) Defective Packaging
d) In correct labeling
e) Foreign matter
f) Microbial contamination
g) Human Error

Preventive Measure:-

a) Clean and sanitize the packing area before starting of work.
b) Mark Master Cartons properly and neatly.
c) Packed the materials in Master Carton without delay.
d) Handle the product carefully while Packing, Remove all packing waste at frequent intervals.
e) Ensure the Quality of packing materials.
f) Store the packed materials at -18 degree C or below.
g) Stack the product in a identical manner to facilitate proper air circulation.
h) Maintain proper rotation of product (first in-first out)
i) Check the temp. of store every two hours.
j) Defrost the store regularly.

5. Transportation for Shipment:

a) Clean and sanitize vehicle.
b) Transport the finished product only in refrigerated van.
c) Keep the vehicle in good running condition.
d) Delay in transportation should be avoided.

V. APDX-V: Organoleptic , Bacteriological & Antibiotic Standard of Frozen Products

Factor	Maximum Tolerance Limit
Net weight	As per buyer's specification
Thawed count/LB or KG	As per buyer's specification
	or Weight per piece
Dehydration	Slight <20% by weight severe<0%
Discoloration of shell/meat	20% for shrimps 10% for all other products
Deterioration	5% for countries other than USA 0% for USA
Decomposition	0 tolerance (severe or mild)
Black spot on shell	10% (mild) by weight for HL/HO products 5% (mild) by weight for peeled products, severe 0%
Malenosis on meat	0 tolerance (severe or mild)
Broken & Damage pieces	<5% (less than 4 segments taken as Broken)
Legs, Veins, Antenna	10%
Soft shell & Hanging meats	<15% by weight (Soft shell) & <5% by weight (Hanging meat)
Objection Foreign matter	NIL
Uniformity of size	U7-31/35= 1.35; 36/40-41/50= 1.4; 51/60-61/70= 1.5; 71/90-

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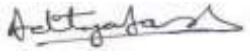

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	91/110= 1.6; 110/130= 1.7
Texture	Slight toughness for HL
	Moderate Toughness for peeled products
Odour	Salty, slightly sweet typical shrimp flavor Typical shrimp aroma: briny, ocean-like. No decomposition odors such as sour, ammonia, fecal, putrid or rancid.
Weight	Declared weight
Grade	Counts should be within the limit
TPC at 37^{0}C	5, 00,000/gms (maximum)
E. coli at 37^{0}C	20/gm (maximum)
Staphylococcus at 37^{0}C	100/gm (maximum)
Salmonella	Absent
V. cholerae	Absent
V. parahaemolyticus	Absent
Chloramphenicol	0.5 ppb
Nitrofurans (AOZ, AMOZ, SEM & AHD)	1.0 ppb

VI. APDX-VI: Sampling Scale

WATER & ICE

a) Water using for processing is tested once in every 15 days for microbiological factors i.e. TPC, Coliform, E.coli, V.cholera
b) Ice is tested once in every 15 days for microbiological factors i.e. TPC, Coliform, E.coli, V.cholera
c) Swabs of tables, utensils, freezing trays, workers hand are tested once in every 15 days for microbiological factors i.e. TPC,Coliform,E.coli, V.cholera are tested for workers hand only.
d) The testing procedure followed and standards used are in accordance with those enlisted in the Bacteriological analysis manual of EIA/CIFT.

RAW MATERIAL

a) Every day sample drawn from raw materials for organoleptic and bacteriological testing.
b) For bacteriological test, one sample is drawn against any center. Subsequently samples are drawn to cover all the center by one week. If centers are more, technologist may relocate the samples procedure.
c) Organoleptic factors are examined for materials against each center by drawing of 1 kg against each lot of 500 Kg. Records are maintained in the Raw material inspection report against each batch of material received.
d) For sulphite residue testing one sample is drawn from each lot.
e) For testing of antibiotics, heavy metals and pesticides one sample is drawn randomly and sent to EIC approved Laboratory for residue analysis.
f) For visual observation on the process of raw material collection at the source at least we visit a supplier at the procurement center once in a month

ON LINE INSPECTION

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Apart from sensory evaluation and organoleptic parameters, colour segregation, weights and grades are checked in the in process materials. One sample is drawn against every 250 Kgs. of materials processed.

FINISHED PRODUCTS

Bacteriological testing for finished products is conducted type wise against each code of production. Pre-enrichment technique for testing of Salmonella is
Undertaken for all varieties against each code touching each grade.

For testing of antibiotics, heavy metals and pesticides one sample is drawn randomly and sent to EIC approved Laboratory for residue analysis. Besides before shipment one composite is sent to EIC approved Laboratory for analysis of residues of antibiotics, heavy metals and pesticides comprising the codes to be shipped in that particular consignment.

For the testing of filth and decomposition, following sampling scale is followed.

No. of Cartons	Sub. Sample
1-20	06
21-200	12
101-above	18

Class of decomposition and nature of filth is ascertained using USFDA methodology and records are maintained accordingly.

For all other parameters, guidelines of quality assurance & monitoring system issued by EIC is followed and time to time any amendment in this regard is taken into consideration, keeping in touch with the Regulatory Authorities.

XIV. Sample Retention

C. BAP observations for RACSL

Primary Product Form for RACSL = Raw
Species = *P. vannamei, L. monodon* = 2
Raw Shrimp = '1' sample from 3 different lots = 3, composited into 1 sample = 1

D. Sample retention:

The QA Technologistis responsible for retaining the frozen samples of 3 lots for each primary product form for every month they are in production. A sample is defined as a minimum of 4 ounces (113 grams). Samples shall be stored for one year from the time the lot is shipped. After one year the samples can be disposed of.

d) ***Purpose of keeping retention samples:***

The purpose of keeping retention samples is to support or verify the food products shelf life period, quality, microbiological, physical and chemical attributes. Retention samples may also be used as part of complaint investigations.

When keeping retention samples of your food product, keep in mind the following:

- Ensure the sample is retained in the same packaging in which it is sold to the consumer.
- Ensure that you keep a quantity that is sufficient to undertake relevant testing including microbiological, chemical and sensory analysis.

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- Retain samples for a minimum of the products shelf life. It is useful to include an addition 10% on top of the shelf life to allow for additional food safety considerations (eg. customer consuming the product past the stated expiry date).
- Ensure you keep the sample secure and at the recommended environmental conditions. You don't want your retention samples spoiled or infested with pests.

It also helps for end of shelf life testing to be undertaken with records maintained of this testing. Maintaining retention samples helps to achieve compliance with the BAP requirements.

Testing and Sampling summary:

Date	Prod. lot number	Product forms	Antibiotic testing	Micro. testing	Sample Retention			
					Date	Time	Officer name	Nu. Allocated

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